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ACRONYMS AND ABBREVIATIONS

ABC	acceptable biological catch
ADF&G	Alaska Department of Fish & Game
AFA	American Fisheries Act
B _{MSY}	target stock size
BSAI	Bering Sea and Aleutian Islands
CDQ	Community Development Quota
CFR	Code of Federal Regulations
CPUE	catch-per-unit-effort
EA	Environmental Assessment
EBS	eastern Bering Sea
EEZ	Exclusive Economic Zone
EFH	essential fish habitat
EIS	Environmental Impact Statement
EO	Executive Order
ESA	Endangered Species Act
F	fishing mortality rate
FMP	Fishery Management Plan
ft	feet
FTE	full-time equivalent
GOA	Gulf of Alaska
HAPC	habitat area of particular concern
IFQ	individual fishing quota
IMPLAN	input-output analysis software program
IR/IU	Increased Retention/Increased Utilization
LLP	License Limitation Program
LOA	length overall
Longlines	hook-and-line
m	meters

ACRONYMS AND ABBREVIATIONS (continued)

max _{ABC}	maximum ABC
mi ²	square miles
MMPA	Marine Mammal Protection Act
MPA	marine protected area
MSA	Magnuson-Stevens Act
MSST	minimum stock size threshold
MSY	maximum sustainable yield
mt	metric tons
NEPA	National Environmental Policy Act
NFS	Northwest Food Strategies
nm	nautical miles
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
NPFMC	North Pacific Fishery Management Council
OFL	overfishing level
OY	optimum yield
PPA	preliminary preferred alternative
Programmatic SEIS	Programmatic Supplemental Environment Impact Statement
PSC	Prohibited species catch
PSEIS	Programmatic Supplemental Environmental Impact Statement
QA	Qualitative Analysis
RFA	Regulatory Flexibility Act
ROD	Record of Decision
TAC	Total Allowable Catch
TK	traditional knowledge
U.S.	United States
USFWS	U.S. Fish and Wildlife Service
VMS	vessel monitoring systems

ES 1.0 Introduction

This executive summary provides an overview of the findings contained in the revised draft Alaska Groundfish Fisheries Programmatic Supplemental Environment Impact Statement (Programmatic SEIS). For more detailed information, the reader should refer to the September 2003 revised draft Programmatic SEIS and its appendices.

This Programmatic SEIS has multiple purposes. First, it serves as the central environmental document supporting the Fishery Management Plan (FMP) for the groundfish fishery in the Bering Sea and Aleutian Islands Area (BSAI) and the FMP for the Gulf of Alaska (GOA) groundfish fishery. The historical and scientific information and analytical discussions contained herein are intended to provide a broad, comprehensive analysis of the general environmental consequences of fisheries management in the Exclusive Economic Zone (EEZ) off Alaska. This document thus, also provides agency decision makers and the public with information necessary for making informed decisions in managing the groundfish fisheries, and sets the stage for future policy decisions and management actions. In addition, it describes and analyzes current knowledge about the physical, biological, and human environment in order to assess impacts resulting from past and present fishery activities. Significant changes have occurred in the environment since the original Environmental Impact Statements (EIS) for the GOA FMP and BSAI FMP were published approximately 25 years ago. While many Environmental Assessments (EA) and several EISs have been prepared for FMP amendments over the ensuing years, none have examined the groundfish FMPs at a programmatic level. The National Environmental Policy Act (NEPA) requires preparation of an EIS (or SEIS) when significant environmental changes have occurred. Significant changes have certainly occurred in the environment as well as within the fisheries themselves. This Programmatic SEIS is intended to bring both the decisionmaker and the public up-to-date on the current state of the environment, while describing the potential environmental consequences of different policy approaches to managing the groundfish fisheries off Alaska. In doing so, it serves as the overarching analytical framework that will be used to shape future management policy with a range of potential management actions.

Additionally, this Programmatic SEIS explains the effects of the current groundfish fishery management regime and selected alternative management regimes, on the human environment. These effects are considered in order to assess whether a different type of management regime should be implemented. These alternative management regimes are illustrated by example “bookend” FMPs that represent a reasonable range of management actions that best represent the types of tools and measures that the North Pacific Fishery Management Council (NPFMC) and the National Marine Fisheries Service (NMFS or NOAA [National Oceanic and Atmospheric Administration] Fisheries) will use to implement the policies in the preferred alternative. For purposes of this Programmatic SEIS, NOAA Fisheries presumes that the Alaska groundfish fisheries result in some significant effects, both positive and negative, to the human and natural environments. This Programmatic SEIS has been structured in a manner that identifies these effects (direct, indirect, and cumulative) to the extent possible, and explores alternative policies and actions that might serve to mitigate adverse impacts. It is anticipated that future NEPA documents will reference this Programmatic SEIS when focusing on issues specific to the action being evaluated at that time. This Programmatic SEIS will require periodic updates as new information and/or significant changes occur in relation to the fisheries or the environment.

ES 2.0 Defining the Problem

A number of pressing issues face those who participate in and manage the Alaska groundfish fisheries. The range of issues includes the effects of the groundfish fisheries on declining Steller sea lion populations and other protected species, the effects of fishing gear on benthic habitat, excess fishing and processing capacity, and the effects of harvesting fish on the North Pacific marine ecosystem. Other notable issues include maintaining sustainable fisheries, reducing bycatch and waste, improving data collection, enforcing regulations, and providing economic stability for fishing communities. These ongoing issues have been targeted by NOAA Fisheries and the NPFMC as a research and management focus.

NEPA requires that a significant federal action (such as a federally authorized fishery) be evaluated for its potential effects on the human environment, which includes physical, biological and socioeconomic components. This goal will be achieved by:

- updating the information contained in the original EISs by providing a historical review of how the groundfish fisheries and the environment have changed since publication of the original EISs;
- describing how new scientific and fishery information is being utilized;
- broadening the scope of analysis contained in the 1998 SEIS for setting Total Allowable Catch (TAC);
- describing the cumulative effects of past, present, and reasonably foreseeable future groundfish fisheries management on the marine ecosystem and the environment (to the extent possible); and
- analyzing the current and alternative management regimes to determine the potential impacts on the human environment.

ES 3.0 What Is a Programmatic Environmental Impact Statement?

A Programmatic EIS is typically a broad environmental evaluation that examines a program, such as fisheries management, on a large scale. Federal agencies have been encouraged to develop “multi-tiered” EISs to streamline the NEPA process. This approach avoids repetition by referencing broad, program-oriented issue analyses in the Programmatic SEIS when preparing subsequent EAs or EISs that focus on specific proposed federal actions. A programmatic EIS is usually prepared at the onset of a new federal program. In this case, the GOA and BSAI FMPs have been in place for approximately 25 years, well before the “programmatic” concept for analysis, and therefore this Programmatic SEIS is being prepared to provide a comprehensive review of the FMPs.

First Draft Programmatic SEIS Timeline

Notice of Intent	October 1999
Scoping Period and Meetings	October 1999 through December 15, 1999
Scoping Report	April 2000
Preparation of First Draft Programmatic SEIS	May through November 2000
Distribution of First Draft Programmatic SEIS	January 2001
Public Meetings	March & April 2001
Completion of Public Review of Draft Programmatic SEIS	July 2001
Review and Synthesis of Public Comments	July through October 2001
NOAA Fisheries decides to revise draft Programmatic SEIS and its Alternatives	November 2001

Second (Revised) Draft Programmatic SEIS Timeline

Preparation of Second Draft Programmatic SEIS	January 2002 through August 2003
Distribution of Second Draft Programmatic SEIS	September 2003
Public Meetings	September & October 2003
Completion of Public Review of Draft Programmatic SEIS	October 2003
Review and Synthesis of Public Comments	November 2003 through January 2004
Final NPFMC Action on Preferred Alternative	Spring 2004
Final Programmatic SEIS released	Summer 2004
Record of Decision	September 1, 2004

ES 3.1 Scope of this Programmatic Supplemental Environmental Impact Statement

NOAA Fisheries determined that the Programmatic SEIS for the Alaska groundfish fisheries should provide a broad analysis of the effects of the GOA and BSAI FMPs on the areas under their management. The Programmatic SEIS includes a cumulative impact analysis of actions that have occurred, and examines policies and potential future actions from a variety of environmental perspectives. By its programmatic nature, this Programmatic SEIS takes a broad look at the issues and the alternatives, and is somewhat qualitative in nature. More case-specific, detailed analyses can be expected in the future as proposed management actions are evaluated in subsequent second-level tiered EAs or EISs. This Programmatic SEIS provides the agency and the public with an analytical framework to examine environmental effects resulting

from other potential fisheries management regimes. Findings that flow from this analysis could result in policy changes and FMP amendments that lead to formal rule-making and implementation of changes to the current FMPs governing the groundfish fisheries off Alaska.

ES 3.2 Programmatic Supplement Environmental Impact Statement Organization

The management of the Alaska groundfish fisheries is a large, complex program that continues to evolve as more information is obtained on the fishery resources, the marine ecosystem, and those that derive benefits from both. The Programmatic SEIS provides a means for informing the public about Alaska groundfish management, the current regime, alternative regimes, known and unknown elements of the ecosystem, and the complex set of laws and regulations that apply to federal fisheries management. To meet its objectives, the document has been organized into a series of chapters and sections.

Chapter 1 establishes the purpose of and need for the federal action supported by this Programmatic SEIS. It provides an overview of NEPA and its procedural requirements, a history of this document including NOAA Fisheries' methods for conducting the NEPA scoping process and addressing public comments, and a review of the future steps that will be taken to finalize the revised draft Programmatic SEIS.

Chapter 2 presents the programmatic alternatives that are the focus of this document, beginning with a detailed explanation of the body of fisheries management policies, practices, tools, and methods that will give readers the foundation for a better understanding of the alternatives. This chapter also contains the preliminary preferred alternative (PPA) for agency and public review.

Chapter 3 describes the physical, biological, and socioeconomic resource components of the BSAI and GOA environments, and the eastern Bering Sea (EBS) and eastern North Pacific ecosystems. The objective of this chapter is to present a description of the relevant history and current status of the resources and environment that will serve as the baseline for the analyses of the alternatives. This chapter also includes a discussion of the past cumulative effects on the human environment, as they contribute to the existing baseline condition.

Chapter 4 discusses the effects of groundfish fishing on the environment under the different alternatives and their associated FMP bookends. The analyses examine the direct, indirect, and cumulative effects of each of the hypothetical FMPs that serve as bookends for the range of management actions appropriate to the particular policy alternative. This chapter then builds on these analyses and presents conclusions regarding the overall effects of the policy alternatives.

Section 4.1 provides a description of the methods used to determine the significance of potential consequences, the methods used to analyze the alternatives, and the application of the model output. The analysis of these model regimes and their contrast to the baseline condition established in Chapter 3 is intended to illustrate the general environmental effects of each programmatic policy alternative. In so doing, this Programmatic SEIS will provide the NPFMC and NOAA Fisheries, as well as the public, with information that can be used to guide future policy decisions.

Section 4.2 presents the analytical framework of the alternatives and their associated FMP bookends that were used as proxies for analyzing the policy alternatives. This section also presents maps that were

developed to interpret the policy alternatives and that depict some of the differences, such as closure areas, between the alternatives.

Section 4.3 presents abstracts of eleven Qualitative Analysis (QA) papers prepared to analyze the FMP components as they relate to the alternatives. These papers describe, in a qualitative manner, the effects of the alternative FMPs on key issues, such as fishing bycatch or overcapacity.

Section 4.4 provides a review of the past/present baseline statements carried forward for cumulative effects analysis for each key issue category.

Sections 4.5 through 4.9 present the analyses of each alternative and their likely environmental consequences, through a detailed examination of the example FMP bookends.

Section 4.10 examines each alternative from a policy-level perspective, drawing on the results from the previous analyses, and Section 4.11 compares the alternatives at the policy-level and presents the major conclusions of the findings on environmental and social issues.

Chapter 5 focuses on research and management, and provides a brief description of existing research priorities in fisheries management, as well as a list of data gaps and research needs for each policy alternative. This section also presents a discussion of management and enforcement considerations for each policy alternative.

ES 3.3 The Federal Action: Management and Authorization of the Alaska Groundfish Fisheries

The federal action in this Programmatic SEIS is defined as the management of groundfish fisheries and the authorization of groundfish fishery activities off Alaska, pursuant to the *Fishery Management Plan for the Groundfish Fishery of the Bering Sea and Aleutian Islands Area* and the *Fishery Management Plan for the Gulf of Alaska Groundfish Fishery* (Section 1.2).

These FMPs were prepared by the NPFMC and approved by the Secretary of Commerce in 1978 and 1981, respectively. The BSAI FMP has been amended 65 times (Section 3.2). As necessary, rules and regulations were prepared to implement each of the FMP amendments. To comply with NEPA, EISs were prepared for the original FMPs when they were approved by the Secretary of Commerce (NPFMC 1978, NPFMC 1981). An EIS or an EA was also prepared for nearly every plan amendment (Appendix C and Appendix D). EAs were also prepared each time a regulation was changed. Since 1991, EAs resulting in a finding of no significant impact have been written for each year's TAC specifications. An analysis of these historical FMP amendments has been conducted as part of this programmatic SEIS. An overview of this analysis is presented in Section 3.2.

ES 4.0 What Are the Alaska Groundfish Fisheries?

ES 4.1 What Fish are Harvested?

The BSAI and GOA FMPs authorize and regulate the commercial harvest of various groundfish species. All of the finfish and invertebrate species in the area subject to the management plan are grouped into five management categories: target, prohibited, other, forage fish, and non-specified. Harvest quotas, or TACs, are set annually for target species either individually or by species group. Prohibited species catch (PSC) limits are set for certain species (e.g., salmon, herring, halibut, king crab, and Tanner crab) that are the target of other domestic fisheries, but are taken incidentally in groundfish fishing operations.

Principal groundfish fisheries are directed on pollock, Pacific cod, sablefish, flatfish, Atka mackerel, and rockfish. Gear types used to harvest fish include bottom and pelagic trawls, hook-and-line (longlines), pot, and jig. About 2.2 million metric tons (mt) of groundfish are taken annually in the combined BSAI and GOA fisheries, with groundfish harvested well below their overfishing level (OFL). Some of the stocks are at or near their all time biomass levels (Bering Sea pollock, Pacific cod, and rock sole), while others are at lower levels of abundance (GOA pollock, various rockfish).

ES 4.2 Where Do the Fisheries Occur?

The groundfish fisheries occur in the North Pacific Ocean and Bering Sea in the United States (U.S.) EEZ from 3 to 200 nautical miles (nm) offshore and between 50°N to 65°N latitude (Figure ES-1). The subject waters, or the action area, are divided into two management areas; the BSAI and the GOA (Section 1.2).

The BSAI groundfish fisheries effectively cover all of the Bering Sea under U.S. jurisdiction, extending southward to include the waters south of the Aleutian Islands west of 170°W longitude to the border of the U.S. EEZ. The GOA FMP applies to the U.S. EEZ of the North Pacific Ocean, exclusive of the Bering Sea, between the eastern Aleutian Islands at 170°W longitude and Dixon Entrance at 132°40'W longitude. The area of the EEZ off Alaska is more than 900,000 square miles (mi²), or larger than the combined EEZs of the east and west coasts of the U.S. Within the EEZ exists the largest continental shelf off the United States. For purposes of this Programmatic SEIS, we have defined this shelf and slope as the submarine shelf from shore to a depth of 1000 meters (m). When defined in this way, 41.5 percent of the BSAI EEZ is comprised of waters overlying the continental shelf and slope. This is where most, if not all, the groundfish fishing occurs, and it is referred to in the Programmatic SEIS as the “fishable area” of the EEZ. Similarly, in the GOA, most fishing also occurs over the shelf and slope, although in contrast to the eastern Bering Sea, the shelf is much narrower and only comprises about 30 percent of the EEZ. The FMPs encompass those areas directly affected by fishing, and those areas that are likely affected indirectly by the removal of fish at nearby sites. The area affected by the groundfish fisheries necessarily includes adjacent State of Alaska and international waters, although the FMPs themselves do not extend into those areas.

ES 4.3 Who Participates in the Fisheries?

Fishermen and processing workers from the states of Alaska, Washington, and Oregon participate in BSAI and GOA groundfish harvesting and fish processing (Sections 3.9.2 - 3.9.4). Approximately 2.0 million mt

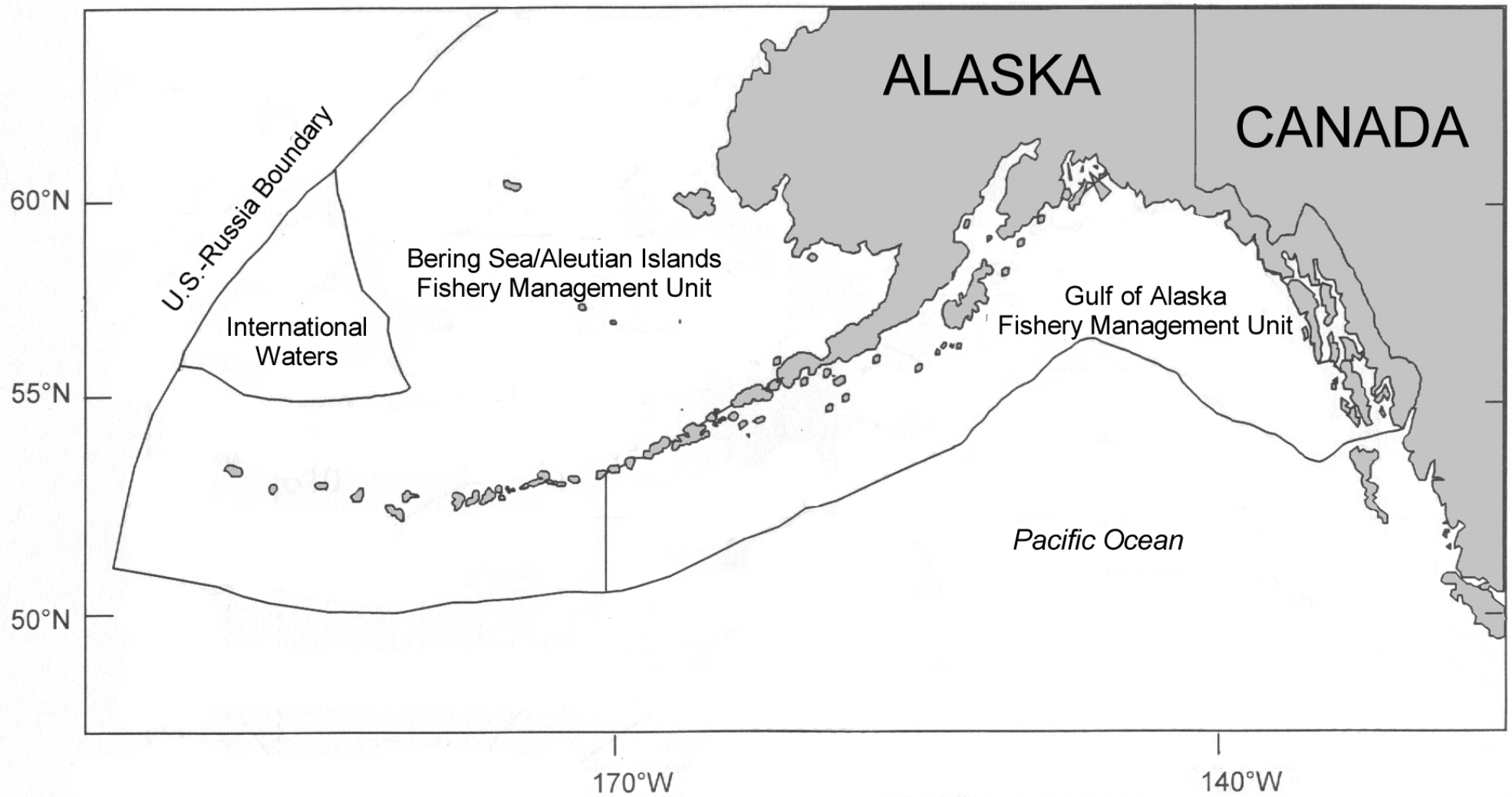


Figure ES-1. Subject groundfish fisheries in the Bering Sea and north Pacific.

of groundfish were landed in 2001; approximately 91 percent of the harvest came from the Bering Sea, with the remaining nine percent from the GOA. About 73 percent of this catch was pollock. In 2001, the ex-vessel value of the groundfish landed and processed was about \$300 million. The approximate wholesale value of the groundfish products produced by the catcher processor and inshore processor/mothership sectors in 2001 was \$1.4 billion. Total harvesting and processing employment was estimated at approximately 10,000 full-time equivalent (FTE) positions, with about 60 percent of the employment going to Alaska residents, and most of the remaining employment going to Washington and Oregon residents. Commercial fishing generates other economic activity in all three states through support services, and generates tax revenue for the State of Alaska and many Alaska communities.

Catcher Vessels: The harvesting sector in 2001 included nine classes of catcher vessels based on primary gear types and fisheries, accounting for 917 vessels. The five trawl classes focus on pollock and, to a lesser extent, Pacific cod. Trawl catcher vessels deliver the vast majority of their fish to at-sea motherships, Bering Sea pollock shore plants, Alaska Peninsula and Aleutian Island shore plants, and Kodiak Island shore plants. Currently, trawlers account for approximately 78 percent of the ex-vessel value of catcher vessel landings. The remaining four vessel classes all use fixed gear. Pot catcher vessels, which are primarily crab vessels that also fish part time in Pacific cod fisheries, account for three percent of the ex-vessel value and payments to labor. Longline catcher vessels focus primarily on high-value sablefish using longline gear in the GOA, and generate approximately six percent of total groundfish ex-vessel value and labor income. The other two fixed-gear catcher vessel classes (vessels less than 32 feet (ft) in length and vessels 33 to 59 ft in length) use longline, pot, and jig gear and have by far the largest number of operations. Both of these fixed-gear classes participate in the groundfish fisheries to augment income from salmon, herring, and halibut fisheries. The larger of these two classes includes more than 514 vessels and generates 12 percent of the total groundfish ex-vessel, primarily through landings of high-value sablefish and rockfish from the GOA.

Inshore Processors and Motherships: Inshore processing facilities (including shore plants and floating inshore processors) and motherships buy raw fish from catcher vessels and then process and freeze it for future use. In 2001, these operations are estimated to have generated more than \$680 million in wholesale product value from groundfish, with nearly \$600 million or 87 percent generated by the five classes of shore plants. In addition, these plants generated about \$240 million in payments to labor and 4,000 FTE jobs in 2001. Bering Sea pollock shore plants had by far the largest output value in 2001 (about \$415 million in wholesale product value). Shore plants on Kodiak Island were the second largest group of shore plants in projected output value (\$81 million wholesale), followed by Alaska Peninsula and Aleutian Islands region shore plants (\$49 million wholesale). Shore plants in southcentral and southeast Alaska process relatively small volumes of groundfish (about 6,000 mt each in 2001). Yet, because these plants process a large proportion of high-value species, such as sablefish and rockfish, together they generated about 8 percent of the total wholesale value and payments to labor. Motherships, which process Bering Sea pollock almost exclusively, generated about \$77 million in wholesale value in 2001.

Catcher Processors: In 2001, there were 89 catcher processor vessels. Five classes of catcher processors were identified based on primary products and gear types. Catcher processors generated about \$740 million in total output (wholesale product value), \$266 million in payments to labor, and the equivalent of about 3,900 full-time jobs in 2001. Surimi and fillet trawl catcher processors operate almost exclusively in the BSAI pollock fishery. The twelve surimi vessels generated about 40 percent of total product value for catcher processors, while fillet trawl vessels added ten percent. Head-and-gut trawl catcher processors, which

typically focus on flatfish and Atka mackerel, produced about \$197 million in wholesale product value. Longline catcher processors, which generally focus on Pacific cod (some also have large sablefish catches), generated approximately \$156 million in product in 2001. Pot catcher processors, which fish for Pacific cod when crab fisheries are closed, are comparatively minor participants in the groundfish fisheries, with about \$7 million in output value.

Regions and Communities that Benefit from Fishing Activities: In addition to vessels and processors, regions that have significant involvement in BSAI and GOA groundfish fisheries include the Alaska Peninsula and Aleutian Islands, Kodiak archipelago, southcentral Alaska, southeast Alaska, Washington inland waters, and the Oregon coast. In general, regional impacts include not only direct effects from harvesting and processing, but also indirect effects generated through tax payments and as income cycles through the regional economies.

The Alaska Peninsula and Aleutian Islands region is, in several respects, the center of the Alaska groundfish fishery, accounting for more than four times the volume of groundfish processed inshore than in the other Alaska regions combined during 1992-2001. Relative dependence on the groundfish fishery varies: four of Alaska's top five groundfish landing ports are in this region, but some communities have little, if any, direct involvement. Fish tax from groundfish is an important underpinning of the regional economy, and groundfish vessel owners, though few in number, are important contributors to the economies of local communities. Kodiak is the dominant region for groundfish in the GOA, but is also an important region for salmon, halibut, and other non-groundfish species. Groundfish accounts for roughly 40 to 45 percent of local processing and fish tax revenues. Participation in the groundfish fishery in southcentral and southeast Alaska is much more limited than in the Alaska Peninsula and Aleutian Islands and Kodiak Island regions. Both southcentral and southeast Alaska have significantly more diversified economies and relatively greater involvement in non-groundfish fisheries compared to the other two Alaska regions.

Regions in the Pacific Northwest also have important links to Alaska's groundfish fisheries. The Washington inland waters region as a whole, especially the greater Seattle area, is engaged in all aspects of the North Pacific groundfish fishery. While Washington is distant from the harvest areas, it is the organizational center of much of the industrial activity that comprises the human components of the fishery-specific industry sectors based in or linked to Seattle are substantially engaged in or dependent on the groundfish fishery. In terms of vessel and processor ownership, involvement in the Alaska groundfish fishery is arguably greater for Seattle than for any other community. However, if the size and diversity of Seattle's overall economy are considered, the groundfish fishery may be less important or vital for Seattle than for the other communities considered in the Programmatic SEIS. The Oregon coast region has long had significant involvement in the fishery, from the development of joint ventures through the present catcher vessels that participate in a variety of fisheries across the Alaska regions.

In addition, six western Alaska Community Development Quota (CDQ) groups, representing 65 rural Alaskan villages, receive a share of the fisheries allocation to facilitate economic development in rural Alaska. The CDQ groups have provided up to 1,000 jobs annually for western Alaska residents, with annual wages of about \$5-8 million; they have also used revenues to fund acquisition of vessels and seafood-related businesses, and to fund infrastructure improvements in western Alaska communities.

ES 5.0 How Are the Fisheries Managed?

The Magnuson-Stevens Act (MSA) established the primary legal framework for the management of the BSAI and GOA groundfish fisheries. FMPs are intended to satisfy the requirements of the MSA as well as other federal mandates including NEPA, Endangered Species Act (ESA), Marine Mammal Protection Act (MMPA), and Executive Order (EO) 12898 on Environmental Justice. The MSA contains ten national standards that serve as overarching policy goals for federal fisheries management. The NPFMC was established by the MSA to serve as a policy advisor to the Secretary of Commerce. Its many responsibilities include the preparation of FMPs and plan amendments for each fishery that requires fisheries conservation and management. The NPFMC employs a very public-oriented process. Its principal job is to make recommendations while attempting to balance sometimes conflicting policy objectives contained in the MSA with those objectives contained in other federal laws. Fishery issues, information, and public proposals are brought to the NPFMC. A system of scientific and industry experts review and advise the NPFMC on how best to manage the fisheries and address management problems that arise. For a more detailed overview of the MSA, other applicable federal laws, and the NPFMC process, see Appendix B.

Regulations specifically governing the groundfish fisheries in the EEZ off Alaska appear at 50 Code of Federal Regulations (CFR) 679. FMPs, amendments to FMPs, and regulatory amendments are developed by the NPFMC, submitted to the Secretary of Commerce for review, and, if approved or partially approved, implemented by federal regulations. Once the regulations are put into effect, NOAA Fisheries has responsibility for the day-to-day management of the fisheries. Enforcement of the regulations is carried out jointly by NOAA Fisheries and the U.S. Coast Guard. In cases where groundfish are harvested and processed in both the EEZ and state waters, these fisheries are cooperatively managed by NOAA Fisheries and the Alaska Department of Fish & Game (ADF&G). For information on how these resources are managed, see Appendix B.

ES 5.1 What Are the Environmental Issues?

The first step in preparing an EIS is scoping. Scoping is designed to provide an opportunity for the public, other federal and state agencies, non-governmental organizations, and other interested groups to provide input on potential issues associated with the federal action. Through both the scoping process and a review of the public comments received on the first draft Programmatic SEIS, ten issues were mentioned frequently, suggesting that these issues are most important to the public (Section 1.5). These issues include:

- effects on target groundfish species
- effects on prohibited species
- effects on forage fish species
- effects on other species
- effects on non-specified species
- effects on essential fish habitat (EFH)
- effects on seabirds
- effects on marine mammals
- effects on social economics of the fishery
- effects on the marine ecosystem

All of these important issues are addressed in this Programmatic SEIS and each alternative is evaluated as to its impacts on each of these issues. Therefore, while there will always be other issues that arise and need to be considered and acted upon, the ten most important issues identified through this NEPA process have been addressed by this Programmatic SEIS.

ES 5.2 How Do the Current Management Plans Address These Issues?

Over the last 25 years, fisheries regulations have been modified numerous times to address environmental and economic issues. Such actions include the establishment of:

- bottom trawl closure areas in the GOA and BSAI based on historic king crab abundance to reduce bycatch and enhance the recovery of depressed crab stocks
- a domestic observer program for the purposes of collecting important fishery information
- a GOA Pacific Ocean perch rebuilding program
- overfishing definitions to protect target groundfish stocks
- a moratorium on new entry into the groundfish fisheries
- specific allocations to inshore and offshore processing sectors to prevent preemption and provide economic stability to Alaska coastal communities
- closure areas around Steller sea lion rookeries to protect these marine mammals from adverse effects of commercial groundfish fishing
- PSC limits to reduce bycatch
- an individual fishing quota (IFQ) Program for the sablefish fishery
- allocations of Pacific cod among the various gear types to promote economic stability
- closed areas to protect sensitive marine habitat

A more detailed summary of the actions can be found in Appendix B.

The NPFMC and NOAA Fisheries are not the only resource agencies that have taken action. The U.S. Fish and Wildlife Service (USFWS) conducts research and monitors walrus, short-tailed albatross, and other seabird populations off Alaska. The ADF&G actively monitors and manages all fishing within state waters and has taken numerous actions to protect nearshore habitats from trawling. The U.S. Congress has also prioritized research, expanded programs, and developed measures that have addressed problems including the phasing-out of foreign fishing, the overcapacity of the groundfish harvesting and processing sectors, and the potential adverse effects of groundfish fishing on Steller sea lions.

ES 6.0 What Are the Fisheries Management Alternatives?

This Programmatic SEIS examines alternative policy statements, each presented in a standard framework that provides management flexibility and allows for adaptation as new information on the ecosystem and the fisheries is obtained. Analyzing environmental impacts of FMPs requires knowing what specific actions could be taken to implement them. Policies are, by definition, high-level, overall statements or plans embracing the general goals and procedures of a government body. Goals and objectives are often used to frame a policy, making it clearer and easier to understand, and provide specific directions for implementation through FMP amendments. Still, determining the ways in which a policy might affect the human environment is difficult to analyze without some indication of how it might be implemented.

Each alternative is comprised of three elements: a management approach statement that describes the goals, rationale and assumptions behind the alternative; a set of management objectives that complement and further refine the goals set forth in the management approach; and, except for Alternative 1 (status quo), a pair of example FMP “bookends” that illustrate and frame the range of implementing management measures for that alternative. The management approach statement and objectives serve to define the direction the NPFMC and NOAA Fisheries wish to follow in the management of the fisheries. The example FMP bookends serve two purposes: first, they provide an additional level of analytical detail that will facilitate the comparison of the physical, biological and socio-economic effects of the alternatives in relation to the environmental baseline (e.g., the condition of the environment and the fisheries in 2002); and second, they provide the public with an illustration of the types of management measures the NPFMC and NOAA Fisheries envision they will use to achieve the goals of the alternative in 2004 and beyond. Ultimately, the preferred alternative will include a policy statement accompanied by a set of management objectives and a set of example FMP bookends that will illustrate a range of implementable management actions. This FMP framework structure will communicate to the public the intent of the NPFMC and NOAA Fisheries as to how they plan to pursue the policy objectives in the future. By providing, as part of the preferred alternative, a range of potential management measures (as illustrated by the example FMP bookends), the NPFMC and NOAA Fisheries retain management flexibility under the MSA to adaptively manage the fishery through FMP amendments. At its June 2003 meeting, the NPFMC recommended a PPA based on a preliminary review of the findings contained in the 2003 draft Programmatic SEIS. The PPA is based on Alternative 3, however it also incorporates policy elements from the other alternatives. NOAA Fisheries has selected this alternative as the PPA for this document. For more information on the PPA, see Section ES 8.0, below.

ES 6.1 Alternative 1: Continue Under the Current Risk Averse Management Policy

Under this alternative, the groundfish fisheries would continue to be managed based upon the present risk-averse policy. Alternative 1(a) represents the policy language currently stated in the FMPs, dating from 1979 and 1985 for the BSAI and GOA FMPs, respectively. These policies, based on the best scientific information available, avoid irreversible or long-term adverse effects on fishery resources and the marine environment, while at the same time providing for optimum yield.

Alternative 1(b) is a substitute for the written policy language in the current FMPs and would include objectives that specifically address the variety of concerns that are balanced by the NPFMC and NOAA

Fisheries in current management considerations. The objectives of this alternative are listed in Table ES-1. Alternative 1(b) encapsulates a risk-averse conservation and management program that is based on a conservative harvest strategy. This policy assumes that fishing does result in some adverse impacts to the environment and that, as these impacts become known, mitigation measures will be developed and appropriate FMP amendments will be implemented.

FMP 1 (Current BSAI and GOA Groundfish FMPs)

The Alternative 1(a) and 1(b) policies are both represented by FMP 1, which is the current FMP for the BSAI and the GOA and incorporates management measures approved by the NPFMC through the June 2002 meeting.

In the current FMPs, the TAC is determined annually based on a conservative harvest strategy that calculates the OFL and the acceptable biological catch (ABC) for each managed stock or stock complex. The current FMPs specify the OFL and maximum ABC (max_{ABC}) by means of a six-tier system wherein the amount and quality of information available for a given stock or stock complex determine the formula that is used to define F_{OFL} (F being fishing mortality rate) and $max F_{ABC}$ (Tiers 1-5) or OFL and max_{ABC} directly (Tier 6). Most stocks are currently managed under Tier 3, where $max F_{ABC}$ equals $F_{40\%}$ if biomass is above $F_{40\%}$. Precautionary adjustments are made, including decreasing F_{OFL} and F_{ABC} linearly with biomass whenever biomass falls below a tier-specific reference level, but only Tier 1 stocks include an uncertainty variation in max_{ABC} . The status of each stock in Tiers 1-3 is also examined annually with respect to the minimum stock size threshold (MSST), as defined in the National Standard Guidelines.

Optimum yield (OY) is specified in the current FMPs as a range that is aggregated across all stocks and does not vary with biomass. The current FMPs require the sum of the individual groundfish TACs to fall within the OY range. In the BSAI, the high end of the range, 2 million mt, acts as a cap on the TACs, as the aggregated ABCs regularly exceed this limit. In practice, although it is not required in the current FMPs, TACs are never set higher than the corresponding ABCs. Taking into account the ecosystem considerations of the food web, the FMPs also prohibit directed fishing for forage species.

Through amendments over the last twenty years, the current FMPs have built up a network of spatial and temporal closed areas, intended to protect resources of concern, as well as to minimize gear conflicts. In the BSAI, various areas around the Pribilof Islands and in Bristol Bay are closed year-round to trawling in order to protect red and blue king crab habitat, and a chinook and chum salmon area are closed seasonally. Also in the BSAI, waters within 12 nm of Walrus Islands are closed to groundfish fishing to minimize disturbance of walrus haulouts. In the BSAI and the GOA, Steller sea lion protection measures permanently close the area within 3 nm of rookeries to all fishing, as a no-transit zone. Additionally, they impose trawl prohibitions within 10 to 20 nm of all rookeries and haulouts, and prohibit fishing in Seguam Pass. In the GOA, trawling is prohibited in southeast Alaska west of 140° West. Also, a 2.5 nm² area designated as the Sitka Pinnacles Marine Reserve in the GOA is closed to groundfish fishing to protect habitat for rockfish and lingcod (see Figure ES-2).

The current BSAI FMP prohibits directed fishing for pollock with non-pelagic trawl gear. There is no similar restriction on pollock trawling in the current GOA FMP. Directed fishing for sablefish with longline pot gear is prohibited in the GOA. Non-pelagic trawling is prohibited in the Bristol Bay Red King Crab Savings Area

Table ES-1. Comparative summary of alternative policy statements.

	Alternative 1	Alternative 2	Alternative 3	Alternative 4	PPA
	NOTE: Language taken from text of alternative policy statements.				
Philosophy	Management process will be adaptive to new information and reactive to new environmental issues.	Establishes a more aggressive harvest strategy, goal would be to maximize biological and economic yield from the resource.	Additional conservation and management measures will be taken as necessary to respond to social, economic or conservation needs, or if scientific evidence indicates that the fishery is negatively impacting the environment.	Extremely precautionary approach to managing fisheries under scientific uncertainty in which the burden of proof is shifted to the user of the resource.	Forward looking conservation measures that address differing levels of uncertainty; precautionary approach that applies judicious and responsible fisheries management practices, based on sound scientific research and analysis, proactively rather than reactively, to ensure the sustainability of fishery resources and associated ecosystems for the benefit of future as well as current generations
Assumptions	Based on the assumption that fishing does produce some adverse impact to the environment.	Based on the assumption that fishing does not have an adverse impact on the environment except in specific cases as noted.	Recognizes need to balance many competing uses of marine resources and different social and economic goals for fishery management.	Based on the assumption that fishing does produce adverse impacts on the environment, but due to lack of information and uncertainty, we know little about these impacts.	Recognizes that potential changes in productivity may be caused by fluctuations in natural oceanographic conditions, fisheries, and other, non-fishing activities, and intends to continue to take appropriate measures to insure the continued sustainability of the managed species.
Plan of Action	As adverse impacts become known, mitigation measures are developed and FMP amendments are implemented; goals will be addressed through existing institutions and processes.		Will utilize and improve upon existing processes to involve a broad range of the public in decisionmaking.	Strategy will result in changes that will significantly curtail the groundfish fisheries until more is known about impacts; once more is known, initial measures will be modified or relaxed.	Will utilize and improve upon existing open and transparent process to involve the public in decisionmaking; will review, modify, eliminate, or consider new issues as appropriate to best carry out the goals and objectives; objectives will be reviewed annually, and PSEIS will be used as a planning document

Table ES-1 (cont.). Comparative summary of alternative policy statements.

	Alternative 1	Alternative 2	Alternative 3	Alternative 4	PPA
	NOTE: Language taken from text of alternative policy statements.				
Prevent Overfishing Harvest Strategy	<ul style="list-style-type: none"> conservative harvest levels for single species fisheries 		<ul style="list-style-type: none"> conservative harvest levels for multispecies and single species fisheries evaluate F_{40} and implement improvements 	<ul style="list-style-type: none"> transition from single-species to ecosystem-oriented management of fishing activities establish a program to maintain ecological relationships among exploited, dependent and related species as well as ecosystem processes that sustain them 	<ul style="list-style-type: none"> conservative harvest levels for multispecies and single species fisheries and specify OY scientific review of F_{40} and adopt improvements as appropriate
OY	<ul style="list-style-type: none"> specify OY as a range with the cap at 2 mill mt in BSAI, .8 mill mt in GOA 	<ul style="list-style-type: none"> specify OY as a range set OY cap at the sum of OFLs or ABCs for each species 	<ul style="list-style-type: none"> specify OY as a range or a formula 		<ul style="list-style-type: none"> specify OY as a range with the cap at 2 mill mt in BSAI, .8 mill mt in GOA
Other			<ul style="list-style-type: none"> improve biological information necessary to determine MSSTs particularly for Tier 4 species 		<ul style="list-style-type: none"> close % of known target stock spawning area
Promote Sustainable Fisheries and Communities¹ Benefit to the Nation					<ul style="list-style-type: none"> provide for OY in terms of providing the greatest overall benefit to the nation with particular reference to food production
Efficiency					<ul style="list-style-type: none"> increase the efficient use of fishery resources taking into account the interest of harvesters, processors, and communities
Stability					<ul style="list-style-type: none"> avoid significant disruption of existing social and economic structures

Table ES-1 (cont.). Comparative summary of alternative policy statements.

	Alternative 1	Alternative 2	Alternative 3	Alternative 4	PPA
NOTE: Language taken from text of alternative policy statements.					
Equity					<ul style="list-style-type: none"> • promote fair and equitable allocation of identified available resources
Safety					<ul style="list-style-type: none"> • promote increased safety at sea
Preserve Food Web Ecosystem Considerations	<ul style="list-style-type: none"> • incorporate ecosystem considerations into fishery management decisions • consider the impact of fishing on predator-prey and other ecological relationships 	(none)	<ul style="list-style-type: none"> • incorporate ecosystem considerations into fishery management decisions 	<ul style="list-style-type: none"> • address the impact of fishing on predator-prey and other important ecological relationships • conserve native species and biological diversity 	<ul style="list-style-type: none"> • incorporate ecosystem considerations into fishery management decisions as appropriate
Fishing Levels	<ul style="list-style-type: none"> • limit harvest of forage species 		<ul style="list-style-type: none"> • improve procedure to account for uncertainty and ecosystem factors in ABCs 	<ul style="list-style-type: none"> • reduce ABCs/set highly precautionary fishing levels to account for uncertainty and ecological considerations 	<ul style="list-style-type: none"> • improve procedure to account for uncertainty and ecosystem factors in ABCs • limit harvest of forage species
Research			<ul style="list-style-type: none"> • develop indices of ecosystem health as targets for management • initiate research program to identify the habitat needs of the significant food web 	<ul style="list-style-type: none"> • develop and implement a Fishery Ecosystem Plan 	<ul style="list-style-type: none"> • develop indices of ecosystem health as targets for management
Reduce and Avoid Bycatch² Level	<ul style="list-style-type: none"> • current bycatch and incidental catch management program • require full utilization of target species 		<ul style="list-style-type: none"> • continue and improve bycatch and incidental catch program • develop incentive programs for bycatch and incidental catch reduction • develop management measures that encourage gear or techniques that reduce discards 	<ul style="list-style-type: none"> • reduce bycatch, incidental catch and PSC • phase out fisheries with >25% bycatch or incidental catch 	<ul style="list-style-type: none"> • continue and improve bycatch and incidental catch program • develop incentive programs for bycatch and incidental catch reduction • develop management measures that encourage gear or techniques that reduce bycatch which includes economic discards

Table ES-1 (cont.). Comparative summary of alternative policy statements.

	Alternative 1	Alternative 2	Alternative 3	Alternative 4	PPA
	NOTE: Language taken from text of alternative policy statements.				
Closures	<ul style="list-style-type: none"> • manage bycatch and incidental catch through seasonal TAC distribution and geographic gear restrictions • respond to population and decline by area, gear and seasonal closures 	<ul style="list-style-type: none"> • manage incidental catch and bycatch through gear closure areas 			<ul style="list-style-type: none"> • manage bycatch and incidental catch through seasonal TAC distribution and geographic gear restrictions
PSC	<ul style="list-style-type: none"> • control PSC through limits 	<ul style="list-style-type: none"> • monitor PSC bycatch and adjust or eliminate limits 		<ul style="list-style-type: none"> • establish GOA PSC limits for salmon, crab and herring 	<ul style="list-style-type: none"> • control PSC through limits or other appropriate measures
TAC	<ul style="list-style-type: none"> • account for bycatch mortality in TAC accounting 			<ul style="list-style-type: none"> • include mortality in TAC accounting and improve accuracy of mortality including unobserved 	<ul style="list-style-type: none"> • account for bycatch mortality in TAC accounting
Non-Target Species			<ul style="list-style-type: none"> • encourage research on population estimates for non-target species with a view to setting bycatch limits 	<ul style="list-style-type: none"> • set stringent bycatch limits for vulnerable non-target species 	<ul style="list-style-type: none"> • encourage research on population estimates for non-target species with a view to setting bycatch limits
Avoid Impacts to Seabirds and Marine Mammals Seabirds	<ul style="list-style-type: none"> • protect ESA-listed and other seabird species 	<ul style="list-style-type: none"> • maintain protection measures for ESA-listed species 	<ul style="list-style-type: none"> • protect ESA-listed and other seabirds • joint research program to establish population estimates for all seabird species 	<ul style="list-style-type: none"> • set protection measures for all seabirds and develop methods to reduce the incidental take levels • joint research program to establish population estimates for all seabird species, and modify protection measures as appropriate 	<ul style="list-style-type: none"> • protect ESA-listed and other seabird species

Table ES-1 (cont.). Comparative summary of alternative policy statements.

	Alternative 1	Alternative 2	Alternative 3	Alternative 4	PPA
	NOTE: Language taken from text of alternative policy statements.				
Marine Mammals	<ul style="list-style-type: none"> maintain protection measures to avoid jeopardy to ESA-listed Steller sea lions 	<ul style="list-style-type: none"> maintain protection measures to avoid jeopardy to ESA-listed Steller sea lions 	<ul style="list-style-type: none"> maintain or adjust protection measures for ESA-listed Steller sea lions review status of other marine mammal and fishery interactions and develop appropriate measures 	<ul style="list-style-type: none"> increase Steller sea lion protection measures by further restricting gear in critical habitat and setting more conservative harvest levels for prey base species 	<ul style="list-style-type: none"> maintain or adjust protection measures for ESA-listed Steller sea lions review status of endangered and threatened marine mammal and fishery interactions and develop appropriate measures
Reduce and Avoid Impacts to Habitat Closures	<ul style="list-style-type: none"> close important habitat to all fishing in response to new scientific information evaluate candidate areas for MPAs 	<ul style="list-style-type: none"> evaluate candidate areas for MPAs 	<ul style="list-style-type: none"> develop goals and criteria to evaluate the efficacy MPAs, consider implementation 	<ul style="list-style-type: none"> establish 20-50% of area as no-take marine reserves prohibit trawling where fishery can be prosecuted with other gear types, and establish trawl closure areas 	<ul style="list-style-type: none"> review and evaluate efficacy of existing habitat protection measures for managed species develop a MPA policy in coordination with national and state policies develop goals and criteria to evaluate the efficacy MPAs, implement if and where appropriate
EFH		<ul style="list-style-type: none"> identify EFH and determine appropriate habitat measures 	<ul style="list-style-type: none"> identify EFH and HAPC 	<ul style="list-style-type: none"> protect habitat including EFH, HAPC, ESA critical habitat, etc. 	<ul style="list-style-type: none"> identify EFH and HAPC
Research	<ul style="list-style-type: none"> implement research to evaluate impacts of trawl gear on habitat 	<ul style="list-style-type: none"> implement research to evaluate impacts of trawl gear on habitat 	<ul style="list-style-type: none"> implement research to evaluate impacts of all gear on habitat develop regional baseline habitat information and mapping 	<ul style="list-style-type: none"> manage adaptively, using large no take areas as experimental controls to facilitate learning 	<ul style="list-style-type: none"> encourage development of regional baseline habitat information and mapping
Allocation Issues³	<ul style="list-style-type: none"> provide economic and community stability through maintaining allocation percentages 		<ul style="list-style-type: none"> provide economic and community stability through fair allocation of fishery resources 	<ul style="list-style-type: none"> consider non-consumptive values 	<ul style="list-style-type: none"> provide economic and community stability through fair allocation of fishery resources

Table ES-1 (cont.). Comparative summary of alternative policy statements.

	Alternative 1	Alternative 2	Alternative 3	Alternative 4	PPA
	NOTE: Language taken from text of alternative policy statements.				
Excess Capacity	<ul style="list-style-type: none"> • reduce excess capacity, overcapitalization and the adverse effects of the race for fish 	<ul style="list-style-type: none"> • maintain AFA and CDQ as authorized by MSA 	<ul style="list-style-type: none"> • maintain LLP and reduce capacity and other adverse effects of the race for fish by extending rights-based management to some or all fisheries • periodically evaluate the effectiveness of rationalization 	<ul style="list-style-type: none"> • reduce excess capacity, employ equitable allocative or cooperative programs to end the race for fish, reduce waste, increase safety and promote stability and benefits to communities 	<ul style="list-style-type: none"> • maintain LLP and decrease excess capacity and overcapitalization by eliminating latent licences and extending rights-based management to some or all fisheries • periodically evaluate the effectiveness of rationalization
Increase Alaska Native Consultation Traditional Knowledge	<ul style="list-style-type: none"> • continue incorporating traditional knowledge into fisheries management 	<ul style="list-style-type: none"> • continue incorporating traditional knowledge into fisheries management 	<ul style="list-style-type: none"> • continue incorporating traditional knowledge into fisheries management, increase traditional knowledge data collection 	<ul style="list-style-type: none"> • utilize traditional knowledge, including monitoring and data gathering, through co-management and cooperative research programs 	<ul style="list-style-type: none"> • continue incorporating traditional knowledge into fisheries management, increase traditional knowledge data collection
Consultation	<ul style="list-style-type: none"> • continue Alaska Native consultation and participation in fisheries management 	<ul style="list-style-type: none"> • continue Alaska Native consultation and participation in fisheries management 	<ul style="list-style-type: none"> • increase Alaska Native consultation and participation in fisheries management 	<ul style="list-style-type: none"> • increase participation of and consultation with Alaska Native subsistence users 	<ul style="list-style-type: none"> • increase Alaska Native consultation and participation in fisheries management
Data Quality, Monitoring and Enforcement⁴ Observer Program	<ul style="list-style-type: none"> • continue Observer Program for catch estimates 	<ul style="list-style-type: none"> • consider repealing the Observer Program 	<ul style="list-style-type: none"> • increase the utility of observer data • improve the Observer Program, including the funding mechanism 	<ul style="list-style-type: none"> • increase the precision of observer data through increased coverage and enhanced sampling protocols, address the funding issue 	<ul style="list-style-type: none"> • increase the utility of observer data • improve the Observer Program, including the funding mechanism
Reporting	<ul style="list-style-type: none"> • continue industry reporting, and efforts to improve economic impact assessments 	<ul style="list-style-type: none"> • continue industry reporting, and efforts to improve economic impact assessments 	<ul style="list-style-type: none"> • increase data and reporting requirements in order to improve economic impact assessments 		<ul style="list-style-type: none"> • increase data and reporting requirements in order to improve economic impact assessments
Technology	<ul style="list-style-type: none"> • increase quality of monitoring data through technology 		<ul style="list-style-type: none"> • increase quality of monitoring data through technology 	<ul style="list-style-type: none"> • improve enforcement and inseason management through technology 	<ul style="list-style-type: none"> • increase quality of monitoring data through technology

Table ES-1 (cont.). Comparative summary of alternative policy statements.

	Alternative 1	Alternative 2	Alternative 3	Alternative 4	PPA
	NOTE: Language taken from text of alternative policy statements.				
Research			<ul style="list-style-type: none"> • establish a baseline ecosystem monitoring program • adopt recommended research plan in the PSEIS • cooperate with research institutions to identify research priorities 	<ul style="list-style-type: none"> • establish a baseline monitoring program, use to improve the Fishery Ecosystem Plan • adopt recommended research plan in the PSEIS 	<ul style="list-style-type: none"> • establish a baseline ecosystem monitoring program • cooperate with research institutions to identify research needs and develop programs
Enforcement					<ul style="list-style-type: none"> • promote enhanced enforceability

Notes: ¹This heading was added to the PPA by the Council to incorporate objectives from the existing BSAI and GOA policy statements (Alt 1(a))

²In the PPA, this heading was changed to: Manage, Reduce and Avoid Bycatch and Incidental Catch

³In the PPA, this heading was changed to: Promote Equitable and Efficient Use of Fishery Resources

⁴In the PPA, this heading was changed to: Improve Data Quality, Monitoring and Enforcement

ABC - acceptable biological catch

AFA - American Fisheries Act

BSAI - Bering Sea and Aleutian Island

CDQ - community development quota

EFH - essential fish habitat

ESA - Endangered Species Act

FMP - fishery management plan

GOA - Gulf of Alaska

HAPC - habitat area of particular concern

LLP - License Limitation Program

MPA - marine protected area

MSA - Magnuson-Stevens Fishery Conservation and Management Act

MSST - minimum stock size threshold

mt - metric ton

OFL - overfishing level

OY - optimum yield

PPA - Preliminary Preferred Alternative

PSC - prohibited species catch

PSEIS - Programmatic Supplemental Environmental Impact Statement

TAC - total allowable catch

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in the BSAI and in the Cook Inlet in the GOA. Additionally, various areas around Kodiak Island are closed to non-pelagic trawling either year-round or seasonally to protect crab stocks (see Figure ES-2).

Groundfish fisheries in the BSAI and GOA are required to discard any incidental catch of halibut, salmon (or steelhead trout), crab, and herring, known collectively as prohibited species. The FMPs currently set PSC limits on many of these species, with penalties ranging from closure of a particular zone or of the whole management area to a directed fishery or fisheries for a specified season or for the remainder of the year. In the BSAI FMP, stairstep limits for trawl bycatch within specified zones are set for red king crab and *C. bairdi* crab. The catch limit varies based on stock abundance. The BSAI FMP also specifies an absolute trawl catch limit for chinook salmon and “other salmon” within specified zones. Once the apportioned PSC limit for a trawl fishery is reached within a zone, the fishery is prohibited from fishing within that zone. The BSAI FMP specifies a trawl catch limit for herring in the BSAI at 1 percent of annual biomass. Catch limits on *C. opilio* crab and halibut bycatch in the BSAI are established in regulation. The *C. opilio* catch limit applies to a specified zone and is based on an adjusted percentage of biomass that must fall within a certain range. The halibut catch limit is a BSAI-wide mt limit and is based on halibut mortality. In the GOA FMP, catch limits on halibut bycatch are authorized and set as part of the annual procedure for setting groundfish harvest levels. There are no other PSC limits set in the GOA.

Other bycatch reduction measures are required under FMP 1. The Increased Retention/Increased Utilization (IR/IU) program requires full retention, by vessels fishing for groundfish, of all incidentally caught pollock and Pacific cod fit for human consumption, as well as full utilization of the two species by inshore processors. A minimum utilization standard of 15 percent is set for all at-sea processors. The NPFMC has also adopted a policy to require full retention of demersal shelf rockfish by longline and jig vessels in the southeast Outside District of the GOA. A Vessel Incentive Program encourages bycatch reduction by setting bycatch reduction standards biannually. If a vessel fails to meet these standards, it can be penalized. Inseason bycatch management measures establish fishing seasons for bycatch management and give the NOAA Fisheries/Alaska Regional Administrator the authority to close areas with high bycatch.

“The Reasonable and Prudent Measures” adopted from the most recent USFWS biological opinion on the short-tailed albatross stipulate the use of certain seabird avoidance measures and require that the take of more than four short-tailed albatross within two years trigger consultation with the USFWS and the potential closure of fisheries. To further reduce the possibility of the take of albatross impacting the fisheries, the NPFMC in 2001 adopted a policy to require all longline vessels to adopt more stringent seabird avoidance methods.

A License Limitation Program (LLP) for groundfish vessels over 32 ft length overall (LOA) (with certain jig gear exceptions) and a moratorium on entry into the groundfish fisheries is in place for the BSAI and the GOA. An Individual Fishing Quota (IFQ) program is in place for sablefish in the BSAI and GOA, which includes provisions for community purchase of quota share. In the BSAI, the directed fishery for pollock is organized into cooperatives as authorized under the American Fisheries Act (AFA). A multi-species CDQ program apportions 7.5-10 percent of all BSAI groundfish quota to 65 eligible western Alaska communities.

FMP 1 monitors the groundfish fishing effort through federal and state reporting requirements and through the use of the North Pacific Groundfish Observer Program. All vessels between 60 ft and 125 ft LOA are required by regulation to have an observer on board 30 percent of the time; for vessels over 125 ft LOA this increases to 100 percent. For AFA and CDQ catcher boats greater than 60 ft LOA, one observer must be on

board at all times, and for catcher processors and motherships, two observers must be on board at all times. The program also has observers at inshore processing plants. An additional monitoring tool is the reporting requirements for BSAI and GOA vessels that submit daily or weekly logbooks including information on the composition of catch and the locations of the hauls. The ADF&G also collects data from fish tickets at the point that catch is sold. Mandatory vessel monitoring systems (VMS) for all directed Atka mackerel, pollock, and Pacific cod fishing verify vessel location.

ES 6.2 Alternative 2: Adopt a More Aggressive Harvest Management Policy

This policy would maximize biological and economic yield from the resource while still preventing overfishing of the groundfish stocks. Such a management approach would, among other things, be based on the best scientific information available, take into account individual stock and ecosystem variability, and continue to work with other agencies in protecting threatened and endangered species. A more aggressive harvest strategy would be implemented based upon the concept that the present policy is overly conservative and that higher harvests can be taken without overfishing the target groundfish stocks. The objectives of this alternative are listed in Table ES-1. This policy assumes that fishing at the recommended levels would have no adverse impact on the environment, except in specific cases that are known and mitigated. If Alternative 2 is adopted, the BSAI and GOA FMPs would be formally amended and the current policy language would be replaced by this new policy.

Example FMP 2.1

Example FMP 2.1 illustrates a more aggressive harvest strategy than Alternative 1 by removing many of the existing constraints from the fisheries. As the policy is based on an assumption that the impacts of fishing on the environment are generally known and mitigated, the precautions currently built into the existing TAC-setting process will be alleviated. The buffer between the ABC level and the OFL is removed, and the maximum OY for the groundfish stocks in the BSAI is released from its 2 million mt cap and allowed to float as the sum of the OFLs for the BSAI groundfish stocks. Additionally, example FMP 2.1 removes the precautionary element of the current FMPs that decreases F_{ABC} linearly with biomass when the biomass falls below a specific reference level.

Example FMP 2.1 also removes physical constraints from the fisheries by repealing the various closure areas currently in place. The fishery would be returned to an open-access scenario, where time and area closures, gear restrictions, and prohibited species catch restrictions are repealed. The potential impact of the groundfish fisheries on Steller sea lions, however, means that the current mitigating suite of protection measures that constrain fishing around rookeries and haulouts and protect Steller sea lion prey species (pollock, Pacific cod and Atka mackerel) when at low biomass levels would remain in place (see Figure ES-3). This is required by the ESA to avoid determinations of jeopardy and adverse modification. The same applies to the impact of groundfish fishing on short-tailed albatross, with the consequent take limits remaining in effect.

The federally-mandated effort limitation program for the directed BSAI pollock fishery, enacted under the AFA, would remain in place, with its accompanying CDQ allocation, but all other effort limitation programs (such as the sablefish IFQ program and the multispecies CDQ program) would be repealed. Reporting

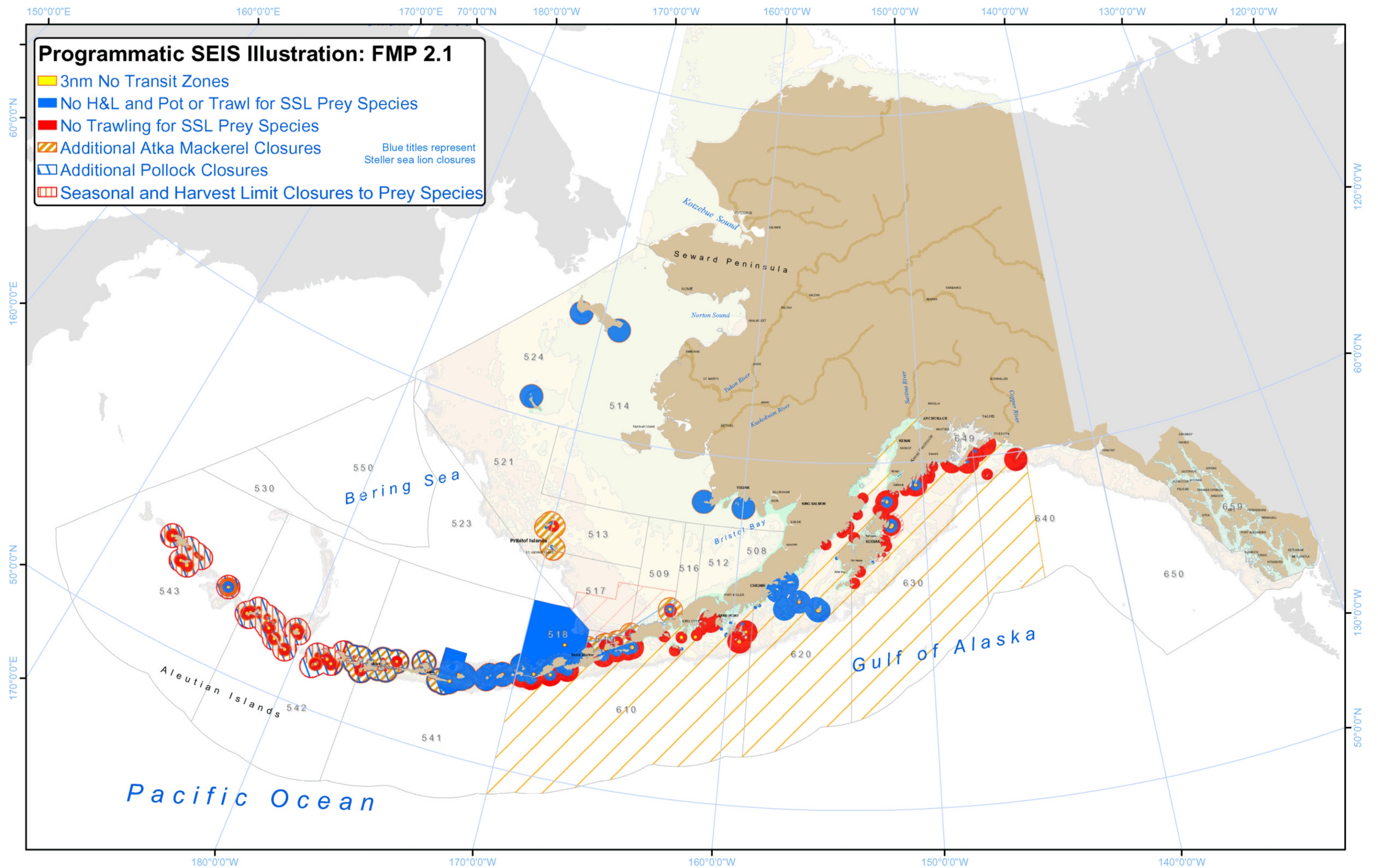


Figure ES-3. Programmatic SEIS Illustration of closure areas included in FMP 2.1

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requirements would remain in place, in order to keep track of the impact of the fisheries, but the observer program, except as federally mandated by the AFA, would be repealed, as would VMS requirements.

Example FMP 2.2

A more moderate illustration of Alternative 2, example FMP 2.2, also represents a more aggressive harvest strategy than Alternative 1. In this case, the mechanisms for setting ABC and TAC remain the same as in the current FMPs (see FMP 1 for further detail), but the existing regulatory capped maximum OY of 2 million mt in the BSAI would be removed in favor of a maximum OY equaling the sum of individual groundfish ABCs in the BSAI. Additionally, bycatch reduction incentives and bycatch restrictions would be repealed, other than those related to PSC limits or IR/IU. Under the assumption that fishing does not have an impact on the environment other than what is generally known and mitigated, the NPFMC's more stringent seabird avoidance measures recommended in 2001 would be repealed, leaving only the mitigation measures recommended by USFWS to avoid jeopardy or adverse modification for short-tailed albatross. Closure areas in example FMP 2.2 mirror those in FMP 1 (see Figure ES-2).

ES 6.3 Alternative 3: Adopt a More Precautionary Management Policy

This policy would seek to accelerate the existing precautionary management measures through community or rights-based management, ecosystem-based management principles and, where appropriate and practicable, increased habitat protection and additional bycatch constraints. Under this approach, additional conservation and management measures would be taken as necessary to respond to social, economic or conservation needs, or if scientific evidence indicated that the fishery was negatively impacting the environment. The objectives of this alternative are listed in Table ES-1. This policy recognizes the need to balance many competing uses of marine resources and different social and economic goals for fishery management. If Alternative 3 is adopted, the BSAI and GOA FMPs would be formally amended and the current policy language would be replaced by this new policy.

Example FMP 3.1

Example FMP 3.1 illustrates a management approach that accelerates precautionary management measures by increasing conservation-oriented constraints on the fisheries where necessary, formalizing precautionary practices in the FMPs, and initiating scientific review of existing practices as a necessary precursor to the decision of how best to incorporate adequate precautions.

Example FMP 3.1 implements changes to the TAC-setting process following a comprehensive review. Precautionary practices such as setting TAC less than or equal to the ABC, and specifying MSSTs for Tiers 1-3 in accordance with National Standard Guidelines, would be formalized in the FMP. Sharks and skates would be removed from the Other Species management category and given their own TACs, and criteria to do the same for other target stocks would be developed. Efforts to develop ecosystem indicators to be used in TAC-setting, as per ecosystem management principles, would be accelerated.

In order to balance the needs of social and economic stability with habitat protection and resource conservation, a review would be conducted of the existing system of closure areas in the BSAI and the GOA (for closure areas under example FMP 3.1, see Figure ES-2), while evaluating them against a marine protected area (MPA) methodology to be developed as part of this alternative. The NPFMC and NOAA

Fisheries would also seek to initiate joint consultation and research with USFWS to develop fishing methods that reduce incidental take of threatened and endangered species. To mitigate adverse impacts of fisheries management decisions on fishing communities, and to comply with other national directives, formal procedures would be implemented to encourage increased participation of Alaska Natives in fishery management.

Example FMP 3.1 recognizes that the anticipated community or rights-based management programs may address bycatch reduction objectives (a review of bycatch rates under existing such programs is initiated), but in the meantime a moderate reduction of PSC limits will be initiated as an intermediary step. PSC limits for crab, herring and salmon would be authorized in the GOA, in addition to the halibut PSC limits authorized under the current GOA FMP. Effective monitoring and timely reaction to change in the environment and the fisheries would be enhanced through improvements in the observer program and third party verification of economic data.

Example FMP 3.2

Example FMP 3.2 implements the acceleration of existing precautionary measures on a more rapid timeline than example FMP 3.1. Rather than reviewing existing practices prior to incorporating increased precaution, this bookend implements changes to many aspects of the FMPs concurrently with the initiation of scientific research efforts necessary to bring management measures in line with a precautionary policy.

Example FMP 3.2 significantly accelerates precautionary management by incorporating an uncertainty correction into the estimation of ABC for all species. Additionally, OY would be specified separately for each stock or stock complex rather than for the groundfish complex as a whole (i.e., OY would be set as a formula rather than as a range, eliminating the BSAI 2 million mt OY cap), and would be set equal to the respective stock or stock complex's TAC. The current precautionary practice of setting TAC less than or equal to ABC would be formalized in the FMP. Example FMP 3.2 would also incorporate stock-specific biological reference points in the tier system where scientifically justifiable. This could result in Tier 3 rockfish stocks, for example, being capped at $F_{60\%}$ rather than $F_{40\%}$. In implementing this bookend, criteria would be developed for specifying MSSTs for Tiers 4-6, along with a list of priority candidate stocks; and the development of criteria for removing some stocks from the Other Species and Non-specified Species management categories would minimally result in sharks and skates being given their own TACs.

Example FMP 3.2 also reexamines the existing closure system in the BSAI and the GOA. The bookend sets a guideline of 0-20 percent of the EEZ (3 to 200 nm) to be closed as a MPA, of which no more than five percent should be completely closed to commercial fishing (designated No-Take Marine Reserve). The remainder of the closed area is designated as no-bottom-contact MPA. The objective of these measures is to provide greater protection to a full range of marine habitats within the 1,000-m bathymetric line (see Figure ES-4). The guideline aims to provide greater protection for a wide range of species, from Steller sea lions to slope rockfish to prohibited species, while at the same time respecting traditional fishing grounds and maintaining open area access for coastal communities. Additionally, the bookend would extend the existing bottom-trawl ban on pollock to the GOA.

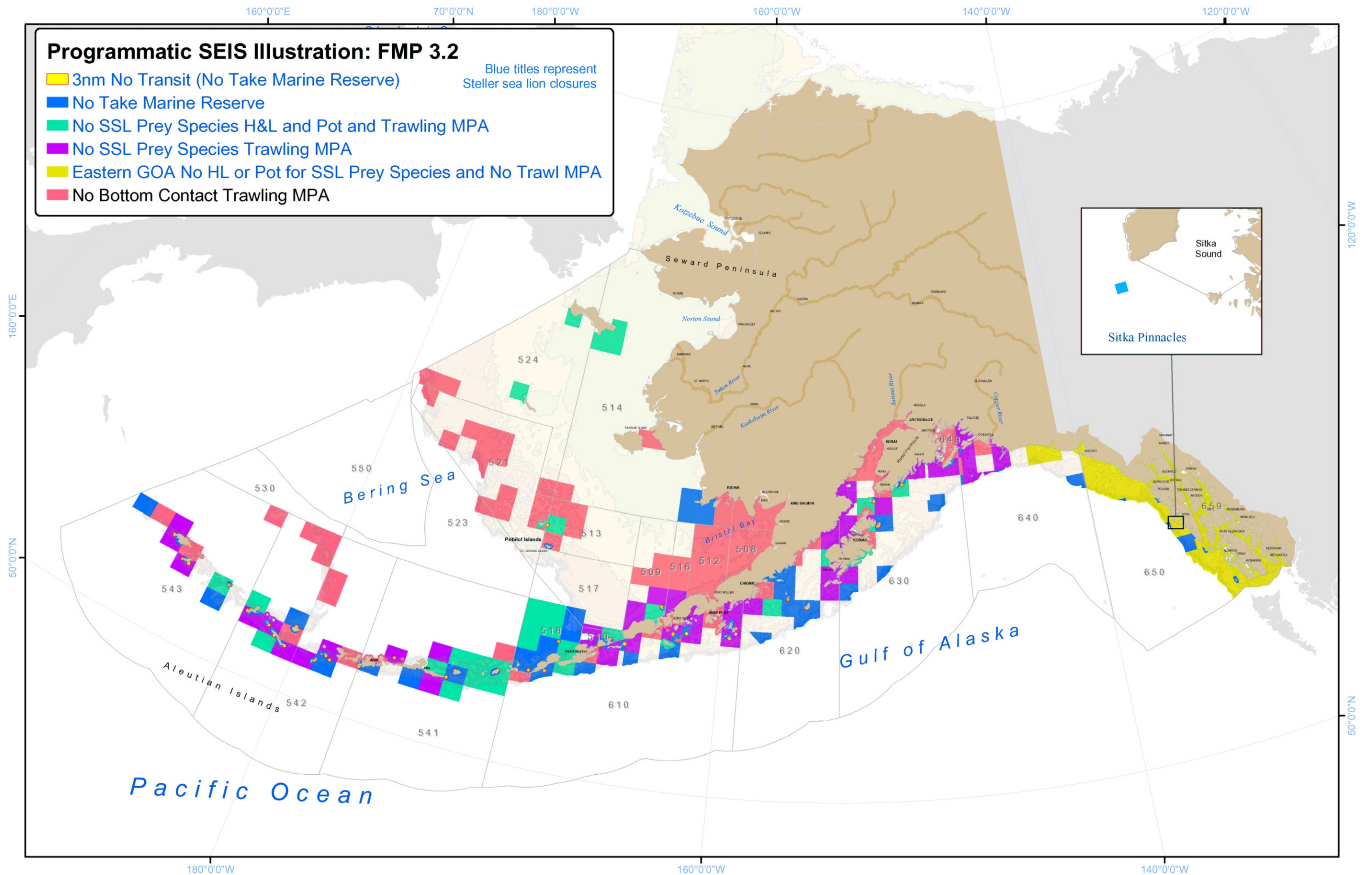


Figure ES-4. Programmatic SEIS Illustration of closure areas included in FMP 3.2

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Additional conservation benefits would be realized in example FMP 3.2 through the comprehensive rationalization of all fisheries (except those already part of a cooperative or IFQ program.) In adopting rationalization programs such as cooperative-style programs with built-in community protections, habitat and bycatch concerns would also be addressed by reducing concentrated effort in the fisheries. To increase precaution regarding bycatch, PSC limits would be significantly reduced (and set for all prohibited species in the GOA), but would not be expected to act as a proportionate restraint on the fisheries due to the incentives for bycatch reduction under cooperatives, or other bycatch incentive programs implemented as necessary under this bookend.

In accordance with ecosystem principles, the NPFMC and NOAA Fisheries would seek to initiate joint consultation and research with USFWS to develop fishing methods that reduce incidental take of all seabird species. Formal procedures would also be implemented to increase consultation with and representation of Alaska Natives in fishery management.

Effective monitoring and timely reaction to change in the environment and the fisheries would be enhanced through increase of coverage and improvements to the observer program, as well as an increase in the use of VMS and the range of economic data collected from industry.

ES 6.4 Alternative 4: Adopt a Highly Precautionary Management Policy

This policy represents an extremely precautionary approach to managing fisheries under scientific uncertainty. It shifts the burden of proof to the users of the resource and the NPFMC and NOAA Fisheries to demonstrate that the intended use would not have a detrimental effect on the environment. It would involve a strict interpretation of the precautionary principle. Management decisions would involve and be responsive to the public, but would decrease emphasis on industry and community concerns in favor of ecosystem processes and principles. The objectives of this alternative are listed in Table ES-1. This policy assumes that fishing does produce adverse impacts on the environment, but due to a lack of information and uncertainty, characterization of these impacts is difficult. The initial restrictive and precautionary conservation and management measures would be modified or relaxed when additional, reliable scientific information becomes available. If Alternative 4 is adopted, the BSAI and GOA FMPs would be formally amended and the current policy language would be replaced by this new policy.

Example FMP 4.1

Example FMP 4.1 illustrates a FMP where current levels of fishing are reduced and other precautionary restrictions are implemented until scientific research shows that the fisheries have no adverse effect on the sustainability of the resource and its environment.

Accordingly, example FMP 4.1 would substantially reduce the potential of adverse environmental impacts of the fisheries. A modified TAC-setting process would create a more substantial buffer between ABC and the OFL by setting the fishing mortality rate at $F_{75\%}$ for all Steller sea lion prey species (pollock, Pacific cod and Atka mackerel) and for rockfish (as long-lived, slow-growing species). Also, the $max F_{ABC}$ for each stock or stock complex in Tiers 1-5 would be adjusted downward based on the lower bound of a confidence interval surrounding the survey biomass estimate. OY would be specified separately for each stock or stock complex rather than for the groundfish complex as a whole (i.e., OY would be set as a formula rather than

as a range, eliminating the BSAI 2 million mt OY cap), and would be set equal to the respective stock or stock complex TAC. The current precautionary practice of setting TAC less than or equal to ABC would be formalized in the FMP. For species managed as members of a stock complex, rather than setting TAC as the aggregate of the individual members' ABCs, the max_{ABC} value for each component stock would be determined and the TAC set equal to the lowest value. Where sufficient biological information is available, such as with EBS pollock, TAC would be distributed on a smaller spatial scale. MSSTs would be determined for all tiers.

To further mitigate the possibility of the fisheries having a detrimental biological and ecosystem impact, 20-50 percent of the EEZ would be designated as No-Take Marine Reserve (i.e., no commercial fishing) covering the full range of marine habitats within the 1,000-m bathymetric line (see Figure ES-5). As part of this area in the Aleutian Islands, a Special Management Area would be established to protect coral and other living bottom habitat. The closed area would include spawning reserve areas for intensively fished species. Under example FMP 4.1, comprehensive trawl exclusion zones would be set to protect all Steller sea lion critical habitat, and trawling would be restricted to those fisheries that cannot be prosecuted with other gear types (i.e., the flatfish fisheries).

In an effort to reduce waste and the risk of adverse impact to the environment, existing PSC limits would be halved under this bookend, as would bycatch (discard) and incidental rates. IR/IU would be extended to all target species. Stringent PSC limits would be set for salmon, crab and herring in the GOA, and as information becomes available, bycatch limits would be set for non-target species also. Protection measures would be set for all seabird species.

Because this policy alternative necessitates greater research and data-gathering efforts, example FMP 4.1 would expand observer coverage to 100 percent for all vessels over 60 ft LOA and require 30 percent observer coverage on vessels presently exempted from observer coverage (i.e., vessels under 60 ft LOA). VMS would be made mandatory for all groundfish vessels, as would motion-compensated scales for weighing all catches at sea or at shore-based processors. In addition, cooperative research and data-gathering programs would be initiated to expand the use of traditional knowledge in fisheries management.

Example FMP 4.2

Example FMP 4.2 expands the precautionary principles of Alternative 4 by suspending all fishing until the fisheries can be shown to have no adverse effect on the resource and its environment. The TAC for all species would be set at zero. All areas of the EEZ would be closed to all fishing (e.g. commercial, recreational, and subsistence) (see Figure ES-6); bycatch and incidental catch, as well as the take of seabirds and marine mammals, would then necessarily be reduced to zero.

Scientific research and data-gathering efforts would continue. When a fishery can be shown to pose no significant threat of adverse biological and environmental impacts, or if adverse effects can be successfully mitigated through use of fishery-specific regulations, the measures illustrated by this FMP bookend would be relaxed to allow fishing to resume.

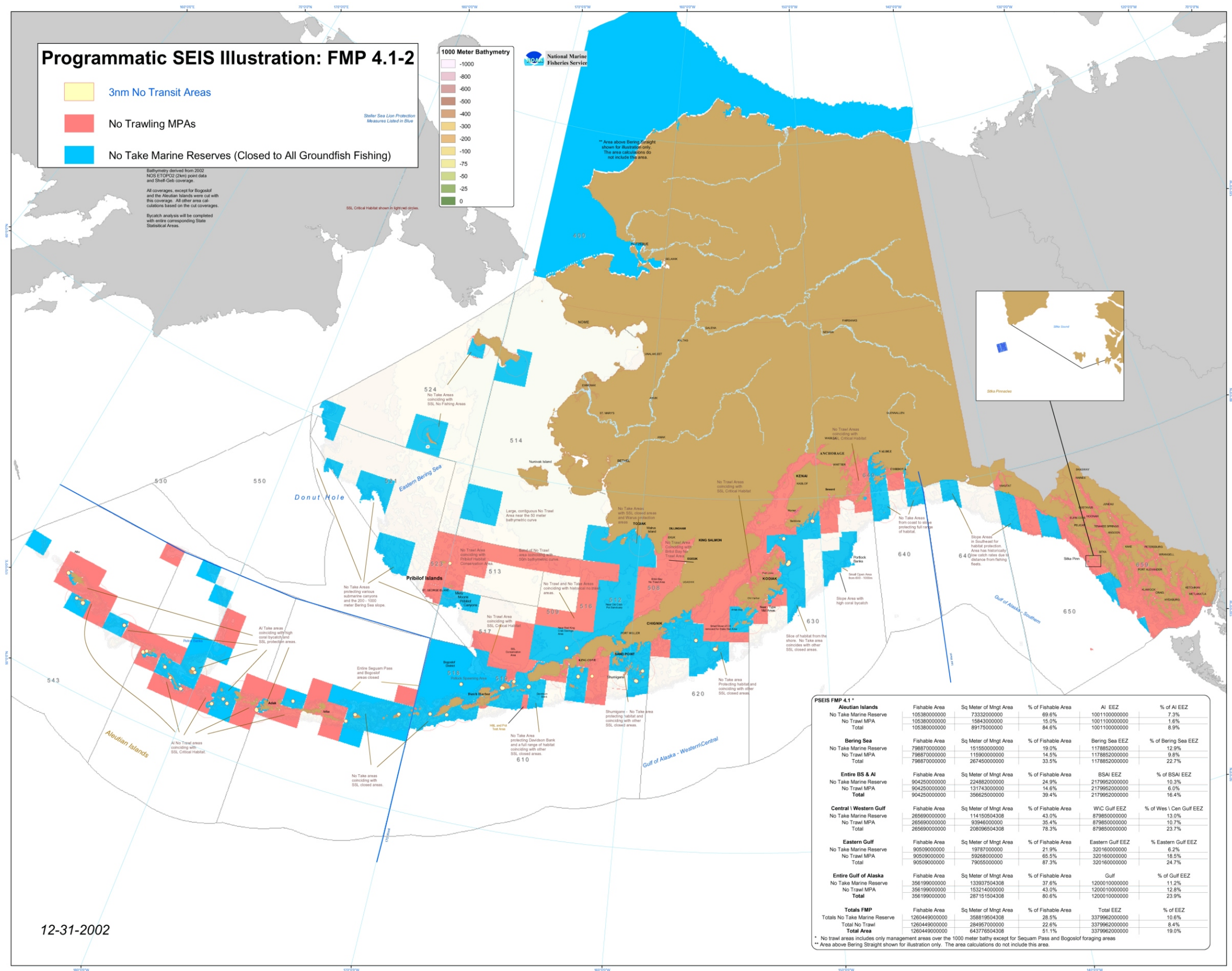


Figure ES-5. Programmatic SEIS Illustration of closure areas included in FMP 4.1

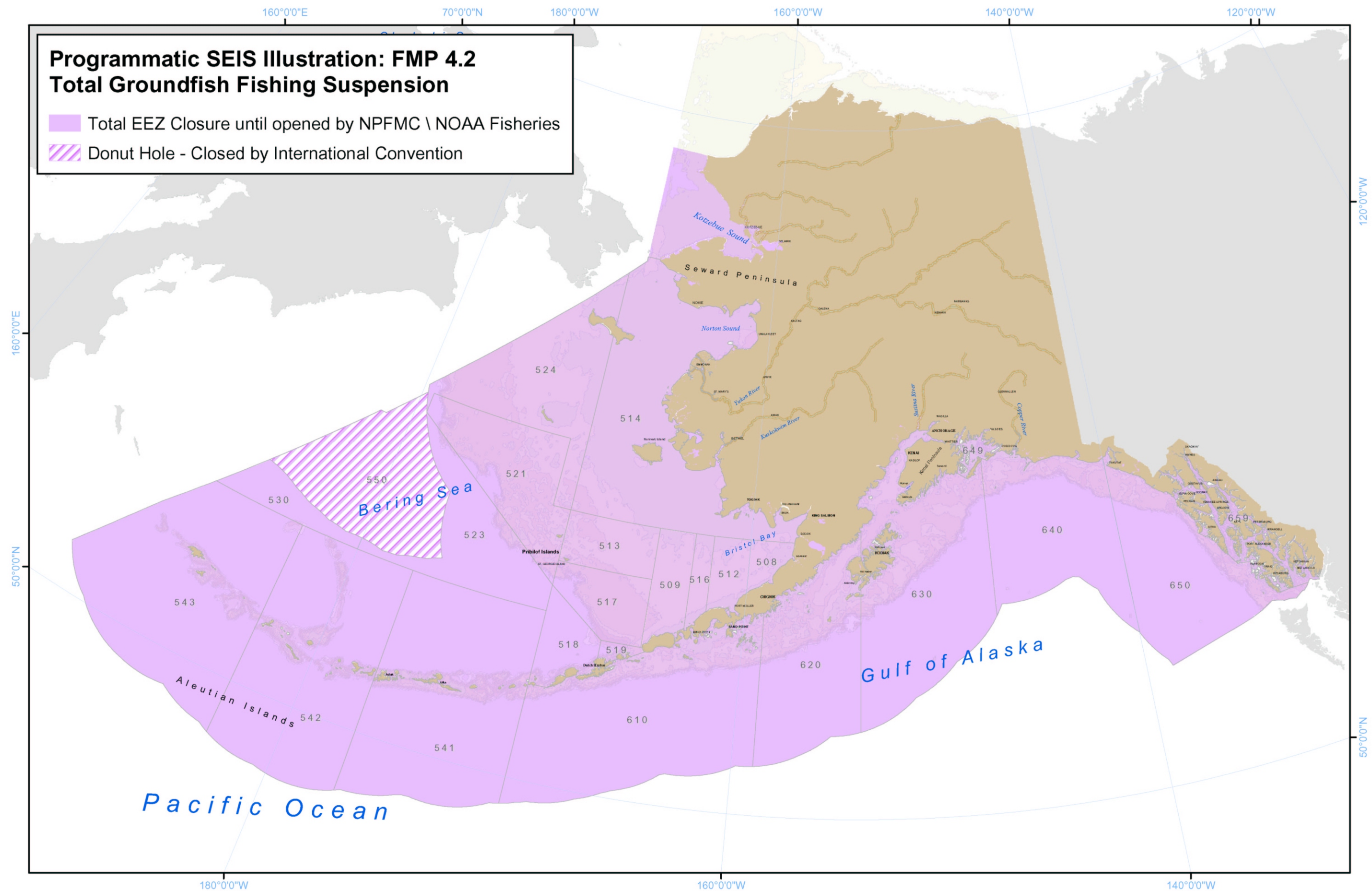


Figure ES-6. Programmatic SEIS Illustration of closure areas included in FMP 4.2

Under this FMP illustration, it is assumed that each groundfish fishery currently conducted in federal waters in the BSAI and GOA would be individually reviewed by the NPFMC and NOAA Fisheries. Upon completion of this review (which may take up to two years), the agency would certify those fisheries that have no significant adverse impacts on the environment and authorize fishing under a specific set of regulations. If a fishery is found by this review to produce significantly adverse environmental effects, and mitigation measures cannot be designed to mitigate those effects, that fishery would not be certified and would remain closed until more scientific information is known.

ES 7.0 Possible Effects of Fishery Management Alternatives

In order to determine the effects of the alternatives, a two-dimensional analytical framework has been developed that defines a range of implementing management measures for each alternative. The framework consists of a set of FMP components (including TAC-Setting Process, MPAs and EFH, Gear Restrictions, etc.) and a set of example FMPs (summarized in the prior section) that include management measures that address each FMP component. Each FMP component focuses on a particular set of policy objectives and is evaluated qualitatively to provide the reader with a general sense of the environmental consequences associated with various management tools and their potential applications in relative isolation of other FMP components, when possible (see Section 4.3 and Appendix F). We then examine each example FMP as a whole, (e.g. a combination of rows) to provide an understanding of how the various components work together to accomplish a number of policy objectives simultaneously (Sections 4.5 to 4.9). Except for Alternative 1, each alternative contains a pair of example FMPs as “bookends” to illustrate and frame the range of that alternative’s management measures. Alternatives 1(a) and 1(b), representing status quo, contain just one FMP; the existing management regime in place for the BSAI and GOA, including NPFMC-approved (but not yet implemented) measures through June 2002. The intention is that the FMP framework structure will represent a range of management measures that address each FMP component and are likely to be implemented under a chosen alternative.

Each of the two dimensions of the framework (the FMP components and the example FMPs) has been analyzed, either qualitatively or quantitatively. Section 4.3 provides a summary of the qualitative assessment papers written for each FMP component. Each paper provides background on the choice of management measures used to address that FMP component and describes the range of management measures that are implemented under each example FMP. Additionally, the papers provide a preliminary assessment of the potential impacts of implementing the management measures in a static environment; cumulative or synergistic impacts among FMP components are not analyzed (for the full text of the papers, see Appendix F).

Following this two dimensional analysis, the results of the analysis of each individual FMP are synthesized as a method for assigning environmental benefits and adverse effects to each policy alternative (Section 4.10). We continue this synthesis by incorporating a policy assessment comparing each alternative against the MSA National Standards and other key environmental laws and policy recommendations (Section 4.11.1). And, finally, we present our overall findings of our analysis for each alternative (Section 4.11.2).

Analysis of these model regimes is intended to illustrate the types of environmental effects that can be anticipated should specific fisheries management actions be pursued in the future. Many potential combinations of management actions could comprise an FMP. Relying on agency experts and public comments received during the preparation of this Programmatic SEIS led to the development of these example FMPs for analytical purposes; they are not intended to represent all possible combinations of actions. As a planning document, this Programmatic SEIS provides the decision makers and the public with a broad range of potential policy objectives and potential management actions. The direct, indirect, and cumulative effects analyzed in this Programmatic SEIS illustrate, to the best of our ability, the environmental consequences and risks associated with each policy alternative. However, this Programmatic SEIS does not prevent the NPFMC or NOAA Fisheries from taking other management actions necessary to achieve its

policy objectives and to protect the ecosystem. In such cases, future FMP amendments will explore all reasonable alternatives to address the stated problem and its accompanying NEPA analyses will fully evaluate the specific proposed action and its environmental impacts. To the extent that such future actions fall within the range of FMP bookends selected as part of the preferred alternative, those future actions can tie from the Programmatic SEIS and by doing so, its amendment development and analysis can be streamlined. In the event a different management tool is designed, or a new environmental issue arises not previously discussed in the Programmatic SEIS, then future NEPA analyses will likely require more detailed analysis and discussion.

ES 7.1 Analytical Approach to Evaluating Alternatives

The analytical approach for simulating current groundfish management in the North Pacific U.S. EEZ involves considering interactions among a large number of species (including target, nontarget, and prohibited), areas, and gear types. To evaluate the consequences of alternative management regimes selected in this Programmatic SEIS, computer modeling was used to predict the likely outcome of management decisions using data on historical catch of different species by gear types and areas, stock assessment surveys, research studies, and industry reported statistics. Management of the Alaska groundfish fisheries is complex given the large numbers of species, areas, and gear types. The managers schedule fisheries openings and closures to maximize catch subject to catch limits and other constraints. These management actions are based on expectations about the array of species likely to be captured by different gear types and the cumulative effect that each fishery has on the allowable catch of each individual target species and other species groups. The groundfish population abundance for each alternative regime was forecasted for a five-year period beginning from the present. Ten and 20 year projections were also predicted, although the confidence intervals surrounding these longer view projections make them highly questionable.

This approach provides a reasonable representation of the current fisheries management practice for dealing with the multi-species nature of catch in target fisheries and for evaluating the different policy alternatives and their associated FMP bookends on the human environment. In addition to the multi-species model, agency analysts also used other models as tools to evaluate the potential impacts of the policies on EFH, the economics of the fisheries, and the effects on fishing communities. All of these models are still in early stages of development and therefore cannot accurately predict all effects with absolute certainty. Thus, agency analysts must qualify their findings and often rely on the scientific literature and the professional opinion of fishery experts in their respective fields to perform qualitative assessments.

More detailed information on the analytical approach used by the agency analysts in preparing this Programmatic SEIS can be found in Section 4.1.

ES 7.2 Summary of Environmental Consequences and Comparison of Alternatives

This section contains a summary of the environmental consequences of each of the alternatives. Table ES-2 presents the information summarized below in table format, and uses a color key to indicate the direction of effect associated with each alternative. The intent of the summary below, and in Table ES-2, is to provide a broad, policy-level understanding of the general impacts of the alternative. The analysis deals with effects at the population or fishery level, rather than calling out impacts to individual components (a more detailed

Table ES-2. Comparison of policy-level impacts of the alternatives.

	Alternative 1	Alternative 2	Alternative 3	Alternative 4	PPA	KEY:
	NOTE: The implication of a split color rating is that major components within the category will undergo a different impact under the alternative in question. To the extent possible, the rationale is explained in the bullets beneath.					
What is the impact of the policy on the sustainability of target stocks (preventing overfishing)?	<ul style="list-style-type: none"> • successful at preventing overfishing of target stocks, ensures sustainable fishery • no incentive to research those stocks on which impacts of fishing are unknown; possible to overharvest a vulnerable member of a stock complex 	<ul style="list-style-type: none"> • maximizes economic yield while preventing overfishing of target stocks, but not effective at preventing stocks from becoming overfished • increases the chance of unintentionally overfishing a stock 	<ul style="list-style-type: none"> • prevents overfishing of target stocks through precautionary harvest policies • acceleration of efforts to identify methods for reducing the number of stocks where the status relative to an overfished condition is unknown 	<ul style="list-style-type: none"> • establishes a very conservative harvest policy which is likely to prevent stocks from becoming overfished • protects most vulnerable species of a complex, but the resulting management would be difficult to implement 	<ul style="list-style-type: none"> • prevents overfishing of target stocks through precautionary harvest policies • acceleration of efforts to improve the current harvest strategy 	adverse impact; may include adverse conclusions that are based on assumptions
What is the impact of the policy on the sustainability of fisheries and communities?	<ul style="list-style-type: none"> • continues to provide economic and community stability within the current system while adapting management programs when the need arises • some fisheries and communities are stressed due to negative effects of the race for fish 	<ul style="list-style-type: none"> • long-term sustainability of fisheries and communities may be problematic if scenarios depicted in 2.1 are implemented; in the short-run fisheries and communities will likely see improved economic conditions • if less aggressive actions are pursued, likely to be no better or worse than Alternative 1 	<ul style="list-style-type: none"> • rationalization of fisheries holds the promise of improved fishery and community sustainability • extensive area closures associated with more aggressive ecosystem-based management may reduce small-boat and Alaska community involvement in fisheries 	<ul style="list-style-type: none"> • extensive TAC reductions and area closures reduce viability of fisheries and fishery dependent communities • some fisheries may survive if assumptions of impacts are correct 	<ul style="list-style-type: none"> • rationalization of fisheries holds the promise of improved fishery and community sustainability • incorporation of community protection elements into rationalization and ecosystem-based management programs are likely to ensure coastal community stability 	no adverse impact if assumptions are correct; no room for uncertainty

Table ES-2 (cont.). Comparison of policy-level impacts of the alternatives.

	Alternative 1	Alternative 2	Alternative 3	Alternative 4	PPA	KEY:
What is the impact of the policy on the stability of the food web and community structures (preserving the food web)?	<ul style="list-style-type: none"> likely effective in protecting food web components that are more well-studied than others and those that are at critical population thresholds uncertain whether sufficient protection is provided to others for which less-complete information is available 	<ul style="list-style-type: none"> high potential to create adverse food web impacts through its lack of precaution for many food web components, which leaves no room for uncertainty 	<ul style="list-style-type: none"> many improvements provide additional protection against uncertainty in order to achieve the goal of preserving the food web if implemented, this strategy is likely to provide protection to a broad range of food web components 	<ul style="list-style-type: none"> very successful in meeting the goal of preserving the food web, by providing large buffers against scientific uncertainty about ecosystem impacts achieves protection of virtually all food web components and thus ecosystem function 	<ul style="list-style-type: none"> many improvements provide additional protection against uncertainty in order to achieve the goal of preserving the food web if implemented, this strategy is likely to provide protection to a broad range of food web components 	no adverse impact if assumptions are correct; accounts for some level of uncertainty
What is the impact of the policy on bycatch (discards) and incidental catch?	<ul style="list-style-type: none"> effective at limiting incidental catch of non-target species and reducing of bycatch insufficient reporting of individual species catch, and catch in shallow water environments 	<ul style="list-style-type: none"> may not be consistent with the goal of reducing and avoiding bycatch through developing practical measures that minimize bycatch 	<ul style="list-style-type: none"> likely successful at reducing prohibited species catch reductions likely to be achieved through incentives for more efficient use of fishery resources under cooperatives, comprehensive rationalization of fisheries or other bycatch incentive programs 	<ul style="list-style-type: none"> bycatch and incidental catch reduction policies are effective achieved through extreme reductions in target groundfish catch and strong bycatch and incidental catch limits 	<ul style="list-style-type: none"> likely successful at reducing prohibited species catch reductions likely to be achieved through incentives for more efficient use of fishery resources under cooperatives, comprehensive rationalization of fisheries or other bycatch incentive programs 	beneficial impact if assumptions are correct; accounts for large level of uncertainty

Table ES-2 (cont.). Comparison of policy-level impacts of the alternatives.

	Alternative 1	Alternative 2	Alternative 3	Alternative 4	PPA	KEY:
What is the impact of the policy on seabird and marine mammal interactions?	<ul style="list-style-type: none"> • effective at providing protection to ESA-listed seabirds and marine mammals • no objectives for protecting non-listed species 	<ul style="list-style-type: none"> • retains protection measures for ESA-listed species, but does not go beyond ESA-required measures • high potential to increase fishery interactions with seabirds and marine mammals which may result in adverse impacts to those species 	<ul style="list-style-type: none"> • goal of minimizing human-caused threats to protected species is largely met • likely to provide increased protection to marine mammals and seabirds 	<ul style="list-style-type: none"> • very successful at avoiding impacts to seabirds and marine mammals • specific objectives to protect all seabirds from fishing interactions, and extend protection measures for Steller sea lion critical habitat and prey base 	<ul style="list-style-type: none"> • effective at providing protection to ESA-listed seabirds and marine mammals • may provide increased protection to seabirds • no objectives for protecting non-listed marine mammal species 	
What is the impact of the policy on protecting marine habitat, including benthic essential fish habitat?	<ul style="list-style-type: none"> • likely effective in protecting habitat components that are more well studied than others; uncertain whether sufficient protection provided to habitat components for which there is less complete information • continued reduction of long-lived slow growing benthic habitat species; continuation of reduced levels of benthic organisms in areas of high fishing intensity 	<ul style="list-style-type: none"> • increased impacts to habitat because of less precautionary management measures • potential changes may result in adverse impacts that may be hard to reverse, especially for long-lived, slow recovering living habitats 	<ul style="list-style-type: none"> • potential to reduce and avoid future impacts to habitat by careful placement of closures • a careful strategy can minimize geographic redistribution and increases in effort, and thus reduce chances of unintended consequences. • historical impacts could have caused long-term and possibly irreversible loss of long-lived, slow growing benthic habitat species 	<ul style="list-style-type: none"> • combination of highly precautionary measures associated with increasing marine reserves and other closure areas will likely achieve protection of, and avoidance of impacts to, habitat • although benefits to habitat accrue due to reduced effort and high use of no-take reserves, uncertain whether they can mitigate the adverse historical impacts affecting the baseline condition 	<ul style="list-style-type: none"> • potential to reduce and avoid future impacts to habitat by careful placement of closures • a careful strategy can minimize geographic redistribution and increases in effort, and thus reduce chances of unintended consequences. • historical impacts could have caused long-term and possibly irreversible loss of long-lived, slow growing benthic habitat species 	

Table ES-2 (cont.). Comparison of policy-level impacts of the alternatives.

	Alternative 1	Alternative 2	Alternative 3	Alternative 4	PPA	KEY:
What is the impact of the policy on the value of marine resources (commercial and non-commercial)?	<ul style="list-style-type: none"> continues to generate substantial producer and consumer benefits in the US, while adapting management programs when the need arises continues policies that have generated environmental concerns tending to keep recreation, tourism and non-market values low 	<ul style="list-style-type: none"> potential to increase allowable catches is expected to significantly increase revenues, but would also increase operating costs non-market, recreational, and tourism values are expected to decline because of the reduced emphasis on these benefits 	<ul style="list-style-type: none"> increased social and economic benefits through the elimination of the race-for-fish while also emphasizing the long-term economic value of the fishery promotes ecosystem based management and is likely to increase non-commercial values assigned to the ecosystem 	<ul style="list-style-type: none"> results in substantial reductions in allowable catches and could also result in the closure of large portions of traditional fishing areas, could jeopardize the continued viability of coastal communities goals of incorporating and enhancing non-consumptive use values are met 	<ul style="list-style-type: none"> increased social and economic benefits through the elimination of the race-for-fish while also emphasizing the long-term economic value of the fishery considers ecosystem-based management and is unlikely to decrease non-commercial values assigned to the ecosystem 	
What is the impact of the policy on Alaska Native participation in fishery management, and their traditional ways of life?	<ul style="list-style-type: none"> Alaska Native consultation and participation in fishery management, and subsistence, would continue to comply with federal law 	<ul style="list-style-type: none"> Alaska Native consultation and participation in fishery management, and subsistence, would continue to comply with federal law increased fishing effort would result in increased economic benefits to fishery participants (particularly CDQ), but potentially increased salmon bycatch 	<ul style="list-style-type: none"> increase current participation and consultation in fishery management by expanding informal and formal consultation and TK data collection rationalization and additional area closures may benefit subsistence by reducing salmon bycatch 	<ul style="list-style-type: none"> directly involves Alaska Natives in fishery management through the development of co-management or cooperative research programs other goals, that greatly reduce or eliminate commercial fishing, would adversely impact Native communities 	<ul style="list-style-type: none"> increase current participation and consultation in fishery management by expanding informal and formal consultation and TK data collection rationalization and additional area closures may benefit subsistence by reducing salmon bycatch 	

Table ES-2 (cont.). Comparison of policy-level impacts of the alternatives.

	Alternative 1	Alternative 2	Alternative 3	Alternative 4	PPA	KEY:
What is the impact of the policy on data quality, monitoring, research, and enforcement requirements?	<ul style="list-style-type: none"> • data collection program will continue to meet minimum acceptable standards • aspects of the program, such as non-random coverage in the 30% component of the fleet, could be improved 	<ul style="list-style-type: none"> • maintains a minimum level of data collection to meet conservation requirements • consideration to repeal the Observer Program may compromise management on the best science available 	<ul style="list-style-type: none"> • likely to be effective at reducing uncertainty through data collection measures, such as improved observer catch monitoring data of target and non-target species, and expanded economic reporting data 	<ul style="list-style-type: none"> • expands research and monitoring programs to fill critical data gaps that may result in the modification of restrictive conservation and management measures • expansion of observer program coverage would result in more complete fishery data, particularly on vessels <125 ft LOA 	<ul style="list-style-type: none"> • likely to be effective at reducing uncertainty through improved data collection and monitoring, promotes research to fill data gaps • explicitly promotes enforceability 	

Notes: CDQ - community development quota
 ESA - Endangered Species Act
 LOA - length overall
 PPA - preliminary preferred alternative
 TAC - total allowable catch
 TK - traditional knowledge

analysis of the example FMP bookends provides a basis for the policy-level analysis). Where the impacts within a policy goal are substantially different for major component groups, the color key in the table is split in half and two colors are assigned. The bulleted language in the table explains the rationale.

The colors assigned to the effects in Table ES-2 are red, yellow, light green, and dark green. Red indicates an adverse effect in the judgement of the analysts, but does not distinguish the degree of uncertainty associated with that effect. Yellow indicates that no adverse effect is expected as long as all analytical assumptions are correct; however, there is no leeway for uncertainty in the assumptions, and the effect could easily veer to adverse. Light green also indicates that no adverse effect is predicted, but the rating accounts for a buffer of uncertainty against the potential that incorrect assumptions may result in an adverse effect. Dark green indicates a beneficial effect, and one in which a large buffer of uncertainty is incorporated.

ES 7.2.1 Summary of Alternative 1

The key policy elements that predominantly influence the impacts under Alternative 1 are: the current harvest strategy that incorporates automatic stock rebuilding (ensuring the sustainability of target stocks); incidental catch and bycatch controls; the existing system of closure areas (to protect a variety of species from groundfish fishery interactions); the objective to reduce the adverse effects of the race for fish (resulting in gradual implementation of rationalization); and reporting and monitoring requirements (increasing the accuracy of catch accounting).

Alternative 1 is successful at preventing overfishing of target stocks and thus meeting the goal of ensuring the sustainability of the fisheries. Alternative 1 also includes automatic stock rebuilding provisions which have proven to be effective. A weakness of this alternative is that there is no incentive to research fishery impacts on Tier 4-6 stocks in order to change their management status. It is also possible under this alternative to overharvest a vulnerable member of a stock complex.

This alternative is partially successful in achieving the goal of preserving the food web through its protection measures for dominant target species, forage species, and ESA-listed species. However, it will likely make slow, incremental progress in protecting other food web components. This policy is likely effective in protecting food web components that are more well-studied than others and those that are at critical population thresholds, but it is uncertain whether sufficient protection is provided to other food web components for which less complete information is available.

The bycatch management program under Alternative 1 is effective at limiting incidental catch of non-target species and reducing bycatch through incentive programs and monitoring. The weaknesses of the alternative are that bycatch is often reported as a complex rather than as individual species, and that observers are not present to monitor catch on vessels less than 60 ft LOA, which may result in inaccurate estimates of bycatch. This alternative may therefore not provide adequate protection for non-target species.

Alternative 1 is effective at providing protection to listed seabirds and marine mammals as a result of its explicit objectives for ESA-listed species. Although not an explicit policy goal, some protection may also be provided to non-listed seabirds through reduced incidental take as a result of implementing additional seabird protection measures.

This alternative emphasizes incremental implementation of habitat protection measures as scientific information becomes available. As a result, impacts to habitat may be alleviated, albeit slowly. This strategy is likely effective in protecting habitat components that are better-studied than others, but it is uncertain whether sufficient protection will be provided to habitat components for which there is less complete information. Cumulatively, continued adverse impacts result from historical impacts that have potentially caused long-term and possibly irreversible loss of living habitat, especially to long-lived, slow-growing species that are slow to recover.

Alternative 1 is expected to continue to provide economic and community stability within the current management system while adapting management programs when the need arises. The alternative could eliminate the race-for-fish and, by doing so, would increase net-revenues to producers and provide benefits to consumers, but would create fewer, although possibly higher paying, fishery related jobs. Non-market, recreation, and tourism values could decrease in the short-run before the transition to rights-based systems is completed.

The goals and policies for Alaska Native consultation and participation in fishery management would continue at the current levels and comply with relevant Executive Orders and other federal law. Traditional knowledge in fishery management would continue to be incorporated in environmental documents as available and appropriate. Subsistence uses would continue consistent with federal law.

This policy will result in a data collection program that will continue to meet minimum acceptable standards for scientific management of the fisheries. Although aspects of the catch collection program could be improved, such as non-random coverage in the 30 percent component of the fleet, current practices do provide useful data for fishery management while remaining mindful of the cost burden on industry of the monitoring program.

ES 7.2.2 Summary of Alternative 2

The key policy elements that predominantly influence the impacts under Alternative 2 are: the resetting of the OY cap to the sum of OFL or the sum of ABCs (resulting in increased yield); the absence of an objective to eliminate the race for fish (resulting in increased effort); the absence of objectives to maintain existing closure areas (resulting in potentially adverse impacts to areas that have been closed to fishing); and the consideration to repeal the Observer Program (resulting in less monitoring and research data.)

The impacts analysis of Alternative 2 is hampered to a certain extent by the fact that controls and restrictions on the fishery are removed under this alternative. It is more difficult to predict the impact of removing rather than imposing restrictions; consequently, the uncertainty about predicted reactions of the fishery and the environment could result in an increased risk to the human environment under this alternative.

Alternative 2 would maximize economic yield while preventing overfishing of target stocks, but is not effective at preventing stocks from becoming overfished. The weaknesses of this alternative are that it increases the chance of unintentionally overfishing a stock and catch estimates may be uncertain under this alternative if the Observer Program is repealed. Also, as in Alternative 1, there is no incentive to change the management status of stocks where the impact of fishing is unknown, and it is still possible to overharvest vulnerable members of a managed stock complex.

There is a high potential to create adverse food web impacts under Alternative 2 through its lack of precaution, which leaves no room for uncertainty. The possible lack of catch monitoring results in the potential for adverse food web impacts to go undetected until dramatic food web changes are seen. This alternative provides less precautionary management to many components of the food web.

Alternative 2, as illustrated in example FMP 2.1, would not be consistent with the objective of monitoring PSC, as repeal of the Observer Program would negatively impact catch monitoring. Alternative 2 policies, as illustrated by example FMP 2.2, would be less severe. As in Alternative 1, additional weaknesses of the alternative are that bycatch is often reported as a complex rather than as individual species, and the absence of observer monitoring of catch on vessels less than 60 ft LOA may result in inaccurate estimates of bycatch. Therefore Alternative 2 may not provide adequate protection for non-target species.

Alternative 2 retains seabird and marine mammal protection measures for ESA-listed species, but does not go beyond ESA-required protection measures. Additionally, other goals and objectives under this alternative remove management measures currently in place in the baseline. The more aggressive harvesting policy, the relaxation of area closures, and the possible repeal of the Observer Program create a high potential to increase fishery interactions with seabirds and marine mammals that may result in adverse impacts to those species.

The alternative could result in increased impacts to habitat because of less precautionary management measures. Possible elimination of current closed areas and increases in TAC have the potential to result in adverse impacts to habitat that could be hard to reverse, especially for long lived, slow recovering living habitats. The policy goal of developing practical measures to minimize adverse effects to EFH could be difficult to achieve if such irreversible impacts occur.

Alternative 2 has the potential to increase allowable catches to maximum biological levels and could eliminate the cushion between ABC levels and levels that result in OFLs. This alternative is expected to significantly increase revenues but would also increase operating costs with the elimination of the LLP and IFQ programs. While fishery production is maximized, product quality and the health and safety of participants suffer. Of particular importance may be the amount of variability in harvests, which could increase significantly and therefore make it much more difficult to make long-term business and infrastructure decisions. Finally, non-market, recreation, and tourism values that accrue to the ecosystem could be reduced substantially.

As in Alternative 1, the goals and policies for Alaska Native consultation and participation in fishery management under Alternative 2 would continue at the current levels and comply with relevant EOs and other federal law. Traditional knowledge in fishery management would continue to be incorporated in environmental documents as available and appropriate. Subsistence uses would continue consistent with federal law. Other goals and objectives in Alternative 2 would affect Alaska Natives by the increase in economic benefits accruing to participants in the fishery, particularly the CDQ pollock fishery. The increased fishing effort under this alternative may, however, result in increased salmon bycatch, which could have adverse effects on salmon fisheries particularly in the western Alaska Yukon-Kuskokwim river system.

Alternative 2 objectives maintain a minimum level of data collection to meet conservation requirements. The consideration to repeal the Observer Program may compromise management on the best science available as a result of reduced accuracy and breadth of fishery data. Because the presumed risk of adversely impacting

the environment is assumed in this alternative to be low, the costs to industry of funding the Observer Program to gather fishery data may not be considered necessary.

ES 7.2.3 Summary of Alternative 3

The key policy elements that predominantly influence the impacts under Alternative 3 are: the emphasis on rationalizing the fisheries (resulting in increased efficiency and flexibility); the incorporation of ecosystem considerations (increasing the uncertainty buffers in management accounting); and the likelihood of additional closure areas (which may result in a variety of impacts, depending how the closures are situated).

Predictions about the impacts under this alternative are difficult due to the uncertainty involved in defining ecosystem management and predicting the impacts of protecting areas. Increased emphasis on relatively less abundant species, through protection measures and increased monitoring, indicates a tendency towards ecosystem management but as the implications of such management are uncertain, the tendency is to tread cautiously while accelerating research and data-gathering. The large potential gain in flexibility from rationalization has the potential to create ecosystem benefits.

Alternative 3 prevents overfishing of target stocks and reduces the likelihood that stocks will become overfished, through precautionary harvest policies and imposition of rebuilding regulations when stocks fall below the level capable of producing maximum sustainable yield (MSY). This alternative would formally define criteria for determining the status of stocks relative to an overfished condition in order to better satisfy the requirements of the National Standard 1 guidelines. Efforts would be accelerated to identify methods for reducing the number of stocks where the status relative to an overfished condition is unknown.

This alternative is successful in making many improvements relative to the baseline in achieving the goal of preserving the food web. The emphasis of this alternative is not only on using the best scientific information available to determine catch levels but also on providing additional protection against uncertainty by designation of MPAs and reserves. If these improvements are implemented, this strategy is likely to provide protection to a broad range of food web components.

The bycatch and incidental catch reduction policies in Alternative 3 are consistent with accelerating precautionary management measures through additional bycatch constraints and monitoring. Bycatch reduction objectives and reductions in incidental catch are likely to be achieved without a major cost to industry due to the incentives for more efficient use of fishery resources under cooperatives, comprehensive rationalization of fisheries, or other bycatch incentive programs implemented under this alternative.

The goal of minimizing human-caused threats to protected species is largely met in this alternative by actively adjusting protection measures, actively reviewing the status of marine mammal fishery interactions, and through research. This approach, which may provide additional conservation measures in response to scientific evidence, is likely to provide increased protection to marine mammals and seabirds.

This alternative has a potential to reduce and avoid impacts to habitat by careful placement of closures. Placement of closures in lightly fished or not fished areas could result in avoidance of future habitat impacts if fisheries were to move effort into surrounding areas. Placement of closures in heavily fished areas can mitigate impacts, reduce unintended consequences, and achieve overall benefits to habitat if closures do not encompass entire habitat types or areas of fishing intensity. In the short term, information from the Observer

Program could be used to locate such closures. In the long term, scientific information gained from this policy can potentially lead to modification of the placement of MPAs and help meet the policy objective to assess the necessary and appropriate habitat protection measures. Cumulatively, the alternative results in a split impact rating, as the adverse condition of the baseline is coupled with continued damage and mortality to living habitat, however the alternative has strong potential to mitigate these adverse impacts.

Alternative 3 promotes increased social and economic benefits through the elimination of the race-for-fish while also emphasizing the long-term economic value of the fishery through the promotion of rights-based allocations to individuals, sectors, and communities. In addition, this alternative promotes ecosystem-based management and is likely to increase non-market, recreational, and tourism values assigned to the ecosystem. It is not possible to determine the long-term effect on overall benefits (commercial and non-market values combined) because it is not known whether the fishing sectors, even with rights-based allocations, will be able to adapt to the changes resulting from the increased emphasis on ecosystem tools and, in particular, the additional number and significance of closed areas.

The goals and policies for Alaska Native consultation and participation in fishery management under Alternative 3 would increase current levels by expanding informal and formal consultation between the NPFMC and NOAA Fisheries and Alaska Native participants and tribal governments. Traditional knowledge would be more formally incorporated in fishery management and additional data would be collected. Other goals and objectives in Alternative 3, such as reductions in PSC limits, may benefit subsistence salmon use by reducing bycatch levels in the groundfish fisheries.

Through data collection measures that will result in reducing uncertainty, Alternative 3 is likely to be effective in achieving the goal of accelerating the use of precautionary management measures. The objectives to improve the Observer Program and observer data will increase the quality of fishery data by implementing increased flexibility of, and potentially expanding, observer coverage. Additionally, the expanded economic data and potential for independent verification would allow for more accurate and credible economic impact assessments. A funding source would, however, need to be identified to implement improvements to these programs.

ES 7.2.4 Summary of Alternative 4

The key policy element that influences impacts under Alternative 4 is the shift of the burden of proof to the user of the resource to demonstrate that the intended use will not have a detrimental effect on the environment. Such a formal policy would raise the standard of justification required for fishery management actions. Key management objectives that implement this approach are: reduce the ABCs, and in turn the TACs, or consider temporarily suspending the fisheries to account for uncertainty; institute extensive closure areas (resulting in the closure of traditional fishing areas and an increased emphasis on non-consumptive values); phase out fisheries with greater than 25 percent incidental catch and bycatch rates; develop a Fisheries Ecosystem Plan; and increase data collection and monitoring (in order to fill in data gaps and adjust restrictive measures as appropriate).

Predictions about the impacts under this alternative are difficult due to the uncertainty involved in defining ecosystem management and predicting the impacts of protecting areas. The emphasis is on instituting protective measures, particularly focusing on less abundant or economically valuable species, while at the same time imposing extensive monitoring and data-gathering to increase understanding of fishery impacts.

Alternative 4 establishes a very conservative harvest policy which is likely to prevent overfishing of target stocks and reduce the chance that stocks would become overfished. Constraints to commercial harvest coupled with systems of closed areas would effectively reduce impacts from the race for fish and therefore from spatial and temporal concentration of catch. Catch monitoring would also increase under this alternative, resulting in more complete fisheries data. As with Alternative 3, this alternative would define criteria for determining the status of all managed stocks relative to an overfished condition in order to better satisfy the requirements of the National Standard 1 guidelines. In the long term, this alternative would protect the most vulnerable species of the complex, but the resulting management of many stocks with low biomass would be difficult to implement.

This alternative is very successful in meeting the goal of preserving the food web, by providing large buffers against scientific uncertainty about ecosystem impacts resulting from fishing. The assumption that the present level of scientific information is insufficient to manage fisheries without excessive risk to the ecosystem results in the implementation of highly precautionary measures. This strategy provides improvements over the baseline and achieves protection of virtually all food web components and thus ecosystem functions. Although the alternative is successful in producing a food web that is less influenced by fishing activity, predictions about the abundance changes of individual food web components that might result are uncertain due to the difficulty in accurately predicting predator-prey relationships.

The bycatch and incidental catch reduction policies under Alternative 4 are effective. Reduced bycatch and incidental catch would be achieved through extreme reductions in target groundfish catch and strong bycatch and incidental catch limits.

Alternative 4 is very successful at avoiding impacts to seabirds and marine mammals through its specific objectives to protect all seabirds from fishing interactions, and extending protection measures for Steller sea lion critical habitat and prey base. This largely increased level of protection provides a substantial buffer against uncertainty with regards to protection of marine mammals and seabirds.

The emphasis of the Alternative 4 policy on habitat provides large buffers against scientific uncertainty about the impacts of fishing on habitat. The combination of highly precautionary measures associated with increasing marine reserves and other closure areas will likely achieve protection and avoidance of impacts to habitat. Cumulatively, the alternative has a split rating, as the existing adverse condition of the baseline includes damage to slow-growing species unlikely to recover within the time period predicted in this analysis, while providing strong protection for habitat and potential for mitigation.

The Alternative 4 goals of incorporating and enhancing non-consumptive use values are met but at the expense of commercial value and potentially the continued viability of coastal communities. The precautionary policies in Alternative 4 could result in substantial reductions in allowable catches and could also result in the closure of large portions of traditional fishing areas. The alternative is likely to result in a substantial increase in the non-market values of the ecosystem, but may also result in a substantial decrease in efficiency, net revenues, and the number of participants in the fisheries.

Alternative 4 would directly involve Alaska Natives in fishery management through the development of co-management or cooperative research programs. Consultation and participation objectives would focus on subsistence uses and cultural values of living marine resources. However, other goals and objectives in Alternative 4, that greatly reduce or eliminate commercial fishing, would adversely impact Native

communities, including CDQ communities, through the loss of employment, economic activity, and community revenues.

Alternative 4 expands research and monitoring programs to obtain information necessary to fulfill the requirements of this alternative. The policy objectives are successful in increasing fisheries data by expanding the Observer Program to full coverage for vessels over 60 ft LOA, and instituting 30 percent coverage on smaller boats. Additionally, the requirements to improve the accuracy of data through technological means such as at-sea scales and VMS will improve monitoring and enforcement under this alternative.

ES 8.0 The Preferred Alternative (Preliminary) and Summary of its Environmental Consequences

ES 8.1 The North Pacific Fishery Management Council and National Oceanic and Atmospheric Administration Fisheries' Preliminary Preferred Alternative

At its June 2003 meeting in Kodiak, Alaska, the NPFMC reviewed the alternatives presented in this Programmatic SEIS and identified a PPA for purposes of soliciting public comment. The PPA, for the most part, takes the policy goals and objectives described under Alternative 3 and merges them with some of the policy elements of Alternatives 1 and 4 (see objectives list below). Several new policy objectives were also added. As a result, the PPA represents a mix and match of the alternatives contained in the Programmatic SEIS. NOAA Fisheries has reviewed this recommendation and has also selected it as the agency's PPA.

The management approach and the objectives in the PPA reflect a conservative precautionary approach to fisheries management and communicate a policy direction for the future. This management approach has, in recent years, been labeled the precautionary approach. As part of the policy, measures will be considered and adopted, as appropriate, which accelerate the precautionary adaptive management approach through community or rights-based management, ecosystem-based management principles that protect managed species from overfishing, and, where appropriate and practicable, increased habitat protection and bycatch constraints. The objectives of this alternative are listed in Table ES-1. This management approach recognizes the need to balance many competing uses of marine resources and different social and economic goals for fishery management, and will utilize and improve upon the existing open and transparent process to involve the public in decision-making.

The example FMP bookends (analyzed in Chapter 4) serve to illustrate management concepts and future actions that logically flow from the PPA and provide sufficient detail to allow for focused analysis of their environmental consequences. The NPFMC and NOAA Fisheries believe that this revised draft Programmatic SEIS provides the public and decision makers with the information they need to understand the challenges in managing a complex fishery, the uncertainties being faced and how managers are addressing those uncertainties, and the value of the Alaska groundfish fisheries to the residents of Alaska, the Pacific Northwest, and the nation.

Example FMP PPA.1

Example FMP PPA.1 illustrates a conservative management approach that continues current risk-averse practices, increases conservation-oriented constraints on the fisheries as appropriate, formalizes precautionary practices in the FMPs, and initiates scientific review of existing practices in order to assess and improve fishery management.

Example FMP PPA.1 builds on the existing conservative procedure for determining ABC and annual quotas. The example FMP implements changes to the TAC-setting process following a comprehensive review. Precautionary practices such as setting TAC less than or equal to the ABC, and specifying MSSTs for Tiers

1-3 in accordance with National Standard Guidelines, would be formalized in the FMP. The NPFMC and NOAA Fisheries would continue to use and improve harvest control rules to maintain a spawning stock biomass with the potential to produce sustained yields on a continuing basis, and to distribute allocations by area, season, and gear as appropriate. Efforts to develop ecosystem indicators to be used in TAC-setting, as per ecosystem management principles, would be continued.

In order to balance the needs of social and economic stability with habitat protection and resource conservation, the NPFMC and NOAA Fisheries would develop a MPA efficacy methodology, including the development of definitions, program goals, objectives, and criteria for establishing MPAs. Additionally, the existing habitat and bycatch area restrictions would be maintained. Measures are also retained to protect ESA-listed species. To minimize bycatch, a moderate reduction of PSC limits in the BSAI will be initiated, and PSC limits for crab, herring and salmon would be authorized in the GOA, including salmon savings areas to be triggered by reaching PSC limits. Effective monitoring and timely reaction to change in the environment and the fisheries would be enhanced through improvements in the observer program and existing reporting requirements.

Existing programs addressing excess capacity and overcapitalization are maintained under this example FMP, with continued development of rights-based management to be undertaken as needed. In order to mitigate adverse impacts of fisheries management decisions on fishing communities, and to comply with other national directives, formal procedures would be implemented to encourage increased participation of Alaska Natives in fishery management.

Example FMP PPA.2

Example FMP PPA.2 accelerates adaptive precautionary management by increasing conservation measures that provide a buffer against uncertainty, instituting research and review of existing measures, and expanding data collection and monitoring programs.

Example FMP PPA.2 significantly accelerates precautionary management by incorporating an uncertainty correction into the estimation of ABC for all species. The current precautionary practice of setting TAC less than or equal to ABC would be formalized in the FMP. Example FMP PPA.2 would also develop and implement criteria for using key ecosystem indicators in TAC-setting, and other precautionary practices. This could result in Tier 3 rockfish stocks, for example, being capped at $F_{60\%}$ rather than $F_{40\%}$. In implementing this bookend, criteria would be developed for specifying MSSTs for priority stocks in Tiers 4-6. The development of criteria to manage target and nontarget species consistently, and for removing some stocks from the Other Species and Nonspecified Species management categories, would begin with breaking sharks and skates out of the Other Species group for TAC-setting.

Example FMP PPA.2 also reexamines area restrictions in the BSAI and the GOA by reviewing the existing system of closure areas in the BSAI and the GOA (for closure areas under example FMP PPA.1, see Figure ES-7 and Section 4.2.3), and evaluating them in conjunction with developing MPAs. The example FMP considers adopting MPAs, with a guideline of 0 to 20 percent of the EEZ (3 to 200 nm) to be closed as a MPA, of which no more than five percent should be completely closed to commercial fishing (designated No-Take Marine Reserve). The remainder of the closed area is designated as no-bottom-contact MPA. The objective of these measures is to provide greater protection to a full range of marine habitats within the

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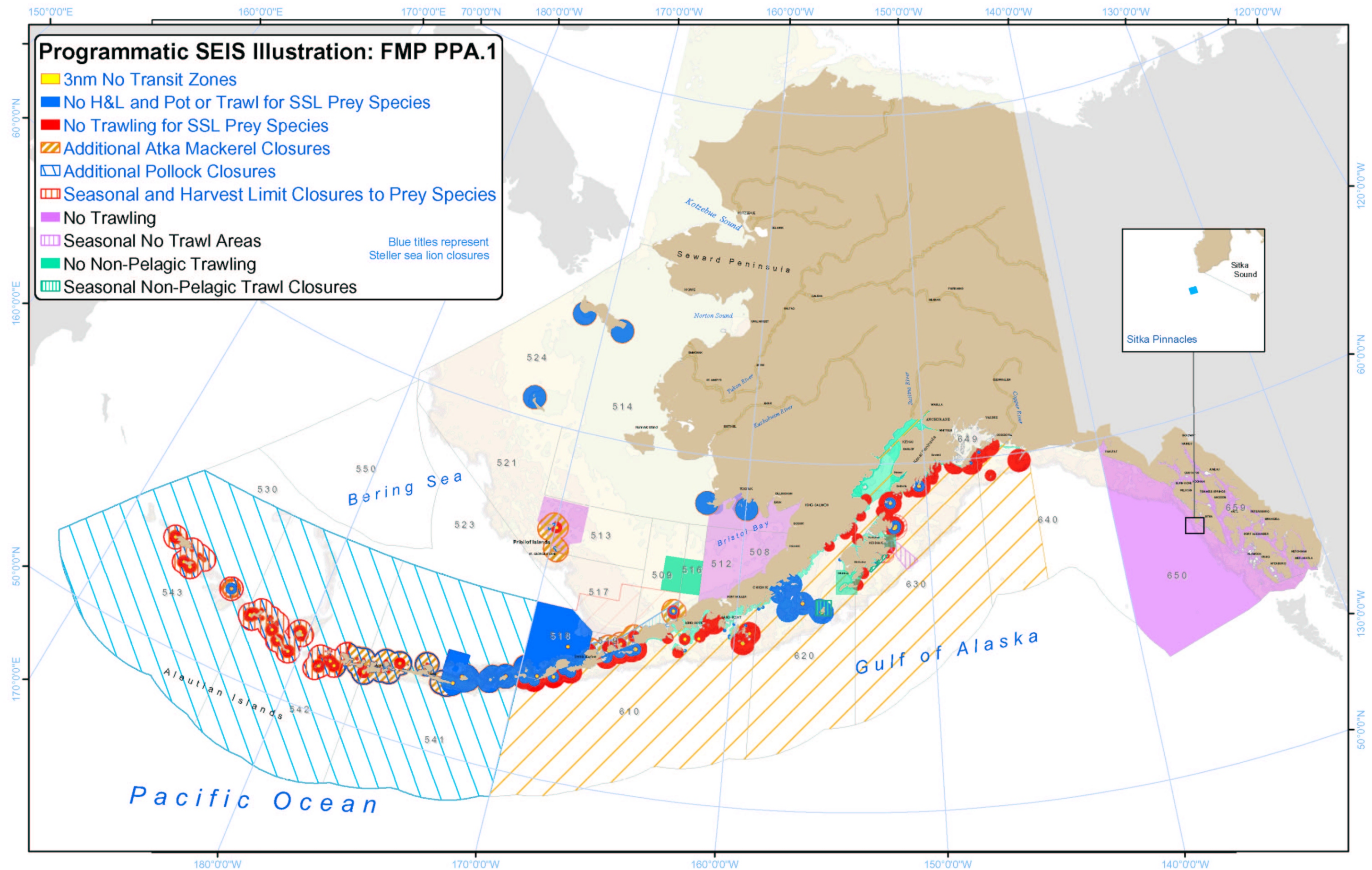


Figure ES-7. Programmatic SEIS Illustration of closure areas included in PPA.1

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1,000-m bathymetric line (see Figure ES-8). This area would incorporate an Aleutian Islands management area to protect coral and living bottom habitat, and also any modification to the 2002 Steller sea lion closures. The closed area may also mitigate adverse effects that occur due to fishing. The guideline aims to provide greater protection for a wide range of species, from Steller sea lions to slope rockfish to prohibited species, while at the same time respecting traditional fishing grounds and maintaining open area access for coastal communities. Additionally, the bookend would extend the existing bottom-trawl ban on pollock to the GOA.

To increase precaution regarding bycatch, existing PSC limits would be reduced and set for all prohibited species in the GOA, and appropriate inseason closure areas would be identified in the GOA. The achievement of these bycatch reductions is expected to be realized through the comprehensive rationalization of all fisheries (except those already part of a cooperative or IFQ program), which reduces concentrated effort in the fisheries, or through bycatch incentive programs implemented in this example FMP.

In accordance with ecosystem principles, the NPFMC and NOAA Fisheries would seek to cooperate with USFWS to develop fishing methods that reduce incidental take of all seabird species in the longline and trawl fleets. Formal procedures would also be implemented to increase consultation with and representation of Alaska Natives in fishery management.

Increases in observer coverage and improvements to the observer data that is collected would enhance effective monitoring and timely reaction to change in the environment and the fisheries. Additionally, the bookend explores programs that would expand the type of economic data collected from industry.

ES 8.2 Summary of Environmental Consequences of the Preliminary Preferred Alternative

This section contains a summary of the environmental consequences of the PPA. Table ES-2 presents the information summarized below in table format, and uses a color key to indicate the direction of effect associated with each alternative. The intent of the summary below, and in Table ES-2, is to provide a broad, policy-level understanding of the general impacts of the alternative. The analysis deals with effects at the population or fishery level, rather than calling out impacts to individual components (a more detailed analysis of the example FMP bookends provides a basis for the policy-level analysis). For more information on the structure of the table and the color key, see the description in Section ES 7.2.

The key policy elements that predominantly influence the impacts under the PPA are: the emphasis on rationalizing the fisheries (resulting in increased efficiency and flexibility); the incorporation of ecosystem considerations (increasing the uncertainty buffers in management accounting); and the likelihood of additional closure areas (which may result in a variety of impacts, depending how the closures are situated).

Predictions about the impacts under this alternative are difficult due to the uncertainty involved in defining ecosystem management and predicting the impacts of protecting areas. Increased emphasis on relatively less abundant species, through protection measures and increased monitoring, indicates a tendency towards ecosystem management but as the implications of such management are uncertain, the tendency is to tread cautiously while accelerating research and data-gathering. The large potential gain in flexibility from rationalization has the potential to create ecosystem benefits.

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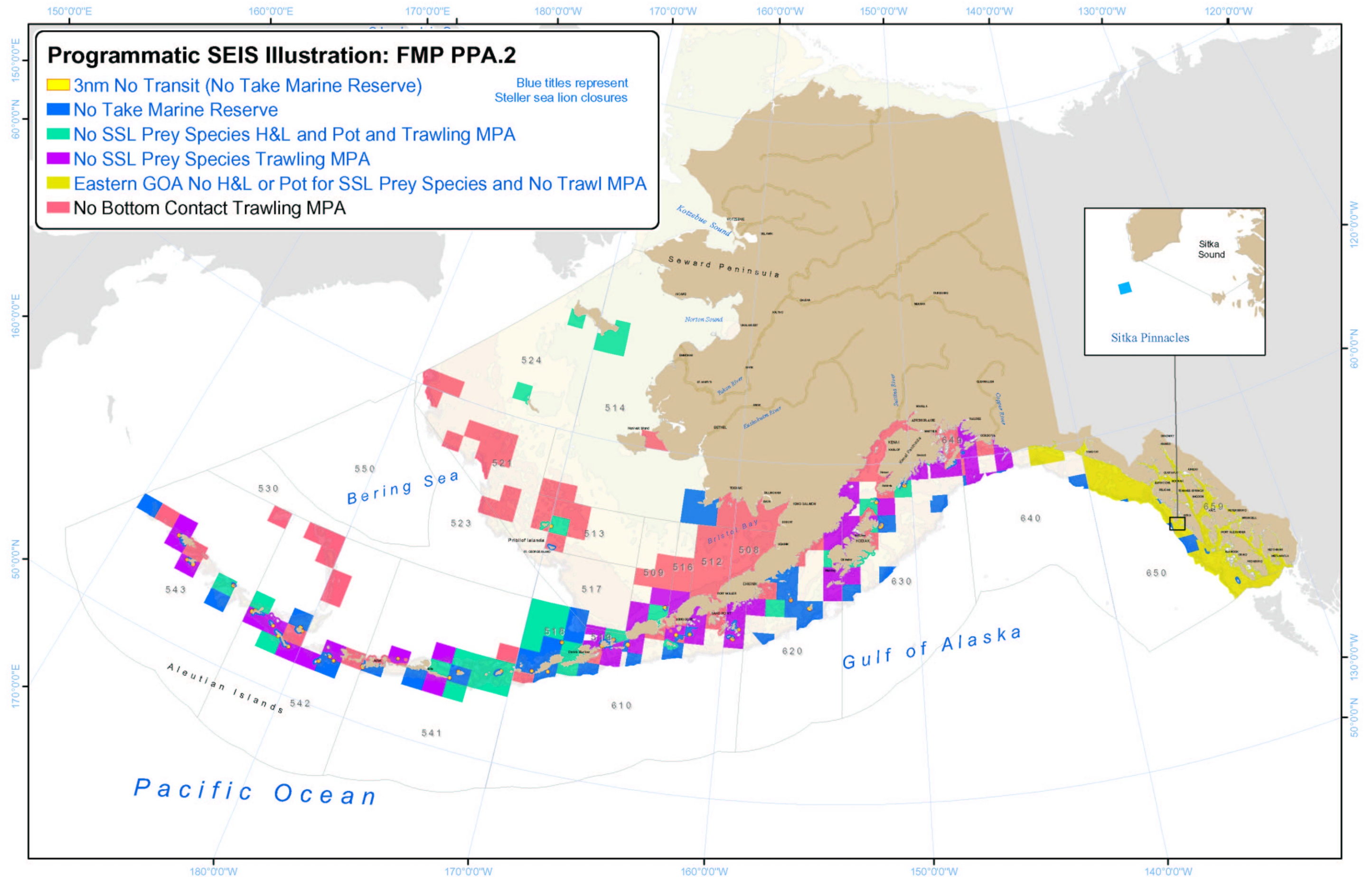


Figure ES-8. Programmatic SEIS Illustration of closure areas included in PPA.2

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The PPA prevents overfishing of target stocks and reduces the likelihood that stocks will become overfished, through precautionary harvest policies, and imposition of rebuilding regulations when stocks fall below the level capable of producing MSY. Efforts would be accelerated to improve the current harvest strategy, including in example FMP PPA.2, additional procedures to incorporate uncertainty and develop spawning stock biomass estimates, in particular for Tiers 4-5.

The goal of promoting sustainable fisheries and communities under the PPA is likely to be successful. The precautionary adjustments made to quota management decrease the risk of inadvertently overfishing managed species. Additionally, the transition to rights-based management under this alternative will promote the objectives of increasing efficiency, stability, and safety in the long-term.

As a whole, through its goal to accelerate precautionary management measures through ecosystem-based principles, and its objectives to develop indices of ecosystem health and to take ecosystem factors into account in ABC-setting, this alternative is successful in making many improvements beyond the status quo in achieving the goal of preserving the food web. The emphasis in this alternative is on using the best scientific information available to determine catch levels, but also on providing additional protection against uncertainty by designation of MPAs and reserves. If these improvements are implemented, this strategy is likely to provide protection to a broad range of food web components.

The bycatch and incidental catch reduction policies in the PPA are consistent with minimizing human-caused threats to protected species and accelerating precaution through additional bycatch constraints, such as reduced PSC limits. Bycatch reduction objectives and reductions in incidental catch are likely to be achieved without a major cost to industry due to the incentives for more efficient use of fishery resources under cooperatives, comprehensive rationalization of fisheries, or other bycatch incentive programs implemented under this alternative.

The goal of minimizing human-caused threats to protected species is largely met in the PPA by actively adjusting seabird and marine mammal protection measures, and status review of endangered and threatened marine mammal fishery interactions. This approach, which may provide additional conservation measures in response to scientific evidence, is likely to maintain protection to ESA-listed marine mammals and seabirds, and may increase protection for other seabirds.

This alternative has the potential to reduce and avoid impacts to habitat by careful placement of closures. Placement of closures in lightly fished or not fished areas will provide mitigation and result in avoidance of future habitat impacts if fisheries were to move effort into surrounding areas. Closures in heavily fished areas should be small to minimize displaced efforts and reduce chances of unintended consequences. To achieve overall benefits, closures should not encompass entire habitat types or areas of fishing intensity. In the short term, information from the Observer Program could be used to locate such closures. In the long term, scientific information gained from this policy can potentially lead to modification of the placement of MPAs and help meet the policy objective to assess the necessary and appropriate habitat protection measures. Cumulatively, the alternative results in a split impact rating, as the adverse condition of the baseline is coupled with continued damage and mortality to living habitat, the alternative has strong potential to mitigate these adverse impacts.

The PPA promotes increased social and economic benefits through the elimination of the race-for-fish while also emphasizing the long-term economic value of the fishery through the promotion of rights-based

allocations to individuals, sectors, and communities. In addition, this alternative promotes ecosystem-based management and is likely to increase non-market, recreational, and tourism values assigned to the ecosystem. It is not possible to determine the long-term effect on overall ecosystem value (commercial and non-market values combined) because it is not known whether the fishing sectors, even with rights-based allocations, will be able to adapt to the changes resulting from the increased emphasis on ecosystem tools and, in particular, the potential addition to the number and significance of closed areas.

The goals and policies for Alaska Native consultation and participation in fishery management under the PPA would increase current levels by expanding informal and formal consultation between the NPFMC and NOAA Fisheries and Alaska Native participants and tribal governments. Traditional knowledge would be more formally incorporated in fishery management and additional data would be collected. Other goals and objectives in the PPA, such as reductions in PSC limits, may benefit subsistence salmon use by reducing bycatch levels in the groundfish fisheries.

Through data collection measures that will result in reducing uncertainty, the PPA is likely to be effective in achieving the goal of accelerating the use of precautionary management measures. The objectives to improve the Observer Program and observer data will increase the quality of fishery data by implementing increased flexibility of, and potentially expanding, observer coverage. Additionally, the expanded economic data and potential for independent verification would allow for more accurate and credible economic impact assessments. A funding source would, however, need to be identified to implement improvements to these programs. The alternative also emphasizes the importance of enforcement concerns in fishery management.

ES 9.0 Overall Conclusions

1. The more precautionary you become, the lower the risk of causing adverse effects on the physical/biological environment. This comes with at least a short term cost to socioeconomic sectors of the environment including fishermen, processors, and coastal communities, although some of this cost could be offset by long term sustainability of the ecosystem, albeit at lower harvests than today.
2. As TAC is reduced, other FMP components currently used by the NPFMC and NOAA Fisheries become less important and may no longer be necessary. For example, at reduced TAC levels, bycatch of prohibited species and non-target species is decreased. Impacts to the benthic habitat are also decreased. Managers may no longer need to specify PSC limits if the measures themselves no longer constrain the groundfish fisheries because the estimated bycatch is now below threshold. Similarly, with reduced TAC levels, it may no longer be necessary to spend time developing a complex web of spatial closures since the impacts of the fisheries on benthic habitat will decrease and such spatial closures may be unwarranted. As a result, the corresponding FMP may be very simplistic compared to today's FMPs.
3. At the policy level, all alternatives have been designed to take into account the requirements of applicable laws, including the MSA, MMPA, and ESA. Some MSA National Standards could go yellow or red (socioecon) as the policy becomes more precautionary with regard to potential physical and biological impacts. Such costs may not be desirable when there is considerable uncertainty regarding the benefits gained by such policies. Similarly, should the NPFMC recommend a more aggressive harvest policy, the risk of overfishing stocks (especially those where we have very little information) increases even though we choose to remain within OFL of target groundfish species.
4. The realities of conducting fishery research often center around funding. It is usually difficult to obtain research funding when you most need it or for all the topics that warrant study. As a result, fishery research has trade-offs—if you investigate some species, others may not be studied. Even if all the required/requested research was funded, it would be difficult to fully implement a large comprehensive program due to the limited number of fishery scientists currently available to do the work.
5. Considerable uncertainty is associated with management of any fishery and these uncertainties continue under all of the alternatives.
6. Under Alternative 2, most controls over the fishery are removed. As a result, it is difficult to predict how the fishery, stocks, etc. will react to such a shift in management policies. Risk to the human environment increases as a result of uncertainty.
7. Adaptive management often results in unexpected consequences (e.g., the “bulge theory” when you change the fishery in one way to address a specific problem, another problem often develops somewhere else).
8. A large biomass or increased biomass does not necessarily translate to a stable or increased level of sustainability. Spawner recruit relationships and other features of the population suggest that sustainability of a resource (and a fishery dependent on that resource) is dependent on more variables than just size of the population.

9. The “race-for-fish” is less than optimal in terms of the allocation of fishery resources. Lessons learned from past experience has proven that a rationalized fishery provides greater benefits to the nation than an open access fishery.
10. Currently, questions exists on whether fishermen can achieve their TACs when displaced from traditional fishing grounds. This is a major area of uncertainty and it means that our predictions of future catches under different closed area scenarios may be incorrect.
11. Closed areas designed as no-take reserves or a form of MPA should be based on the best available science and the NPFMC and NOAA Fisheries should work closely with public stakeholders and coastal communities in seeking the best areas for protection that provide the greatest benefits to habitat while minimizing adverse social and economic consequences.
12. Careful placement of small closures within heavily fished areas can potentially mitigate some habitat impacts and help avoid unintended consequences of displaced effort. The size of the closures, if determined necessary, will depend on a number of factors including the distribution of the valued habitat-type, frequency and intensity of impacts, research needs, and enforcement considerations. Such closures could promote scientific understanding of the effects of fishing on habitat and help determine the efficacy of MPAs.
13. A policy is a statement of goals and objectives and provides direction based on values of the people. It should be referred to frequently to ensure that decisions are consistent with the policy. Periodic review and, if necessary, revision of the policy is prudent.

ES 10.0 Some Frequently Asked Questions about the Alaska Groundfish Fisheries and this Programmatic Supplemental Environmental Impact Statement

1. What is the proposed action and how does it meet that purpose and need?

The proposed action is the continued authorization and management of the Alaska groundfish fisheries. We accomplish this by having the NPFMC and NOAA Fisheries review their past management policies and practices and consider updating these policies and practices to better reflect the future direction of the fisheries. Assuming a change is necessary, an FMP amendment will replace the current policy language with a revised policy statement. The policy statement is defined as the management approach statement and its accompanying policy objectives.

2. Is the current policy for managing the Alaska groundfish fisheries conservative and risk-averse?

Yes. Formally, there are mechanisms built into the harvest policy which minimize the likelihood of inadvertently fishing at non-sustainable fishing mortality rates. Furthermore, there are extra measures of protection that limit the overall harvest including an overall cap on the amount of quota that can be specified in a given year, seasonal and area closures, and bycatch limits. Also, the quota management system has a high level of monitoring through the observer program which tracks target and non-target species catch. Monitoring in-season catch levels allows for fishery closures to ensure that allowable species-specific catch levels (which are always specified as being below the OFL) are not exceeded.

3. Can the current management policy statement in the BSAI and GOA Groundfish FMPs be improved?

We believe so. The BSAI and GOA policy statements currently in the groundfish FMPs reflect a period in history when foreign dominated fisheries occurred off Alaska. Both national and regional policy emphasis was to encourage the development and expansion of domestic groundfish fisheries. This policy goal was accomplished by the mid-1980s. Since then, other issues have risen to the forefront of the NPFMC and NOAA Fisheries. These include an increased environmental awareness, the identification of bycatch, waste, and fishery allocation problems, as well as concerns over the decline of Steller sea lions and the general health of the fisheries due to overcapacity.

4. Must the NPFMC and NOAA Fisheries select the alternative that is the most protective of the physical and biological environment?

No. The NPFMC and NOAA Fisheries are free to choose any of the alternatives as long as they explain clearly their rationale for their decision. NEPA does not require a decision maker to choose the environmentally preferred alternative. MSA requires that NPFMC and NOAA Fisheries balance conservation with needs to harvest OY from the resource. MSA requires that the NPFMC and NOAA Fisheries consider human needs as well as fishery and ecosystem needs. As long as the preferred

alternative is explained, and its potential environmental consequences identified, the decision maker is free to select any of the alternatives.

5. What actions are contained in the preferred alternative?

The preferred alternative will contain two elements: 1) the policy statement and accompanying policy goals and objectives; and 2) the FMP framework, which is a range of management measures defined by two example bookend FMPs. In addition to the preferred alternative, a schedule for implementation of the selected policy will also be recommended by the NPFMC and NOAA Fisheries and will serve to illustrate the prioritization of the preferred alternative's objectives and to provide to the public a schedule under which they can reasonably expect certain actions to occur. This implementation schedule, along with the selected alternative, will be published with the Record of Decision (ROD) on this Programmatic SEIS.

6. What is the purpose of the FMP framework and the bookends? Can the NPFMC or NOAA Fisheries go outside the bookends?

The FMP framework, comprised of two example FMPs is provided to illustrate a range of potential actions and a range of environmental consequences associated with the adopted policy statement. The FMP framework will not be included in the plan but used to better communicate to the public the NPFMC and NOAA Fisheries' intentions and overall policy direction. The FMP framework identifies a number of management tools and example applications to provide the public with the likely types of actions and measures the NPFMC and NOAA Fisheries will pursue in order to achieve the selected policy objectives. The FMP framework is provided in the Programmatic SEIS and ROD to illustrate the NPFMC's and NOAA Fisheries' commitment to implementing its policy. The "NEPA advantage" that we want to gain with the SEIS, is more timely and focused preparation of NEPA documents that will analyze the effects of future plan amendment proposals and their alternatives and ensure they are consistent with a stated policy direction. Providing an FMP framework and illustrating a range of actions and environmental consequences illustrates for the public that fishery managers require flexibility in their management program and must have the ability to adapt to changing environmental conditions or new scientific information. In the event the NPFMC and NOAA Fisheries find that a future plan amendment would fall outside the FMP range of bookends, then follow-up NEPA analyses will need to be broader in scope and will likely require more time to prepare. This was CEQ's goal in developing the Programmatic EIS concept. A Programmatic EIS would allow follow-up tiering as a way to improve efficiency in government.

7. Once a preferred alternative is adopted and a final Programmatic SEIS released, what happens next?

After a minimum of 30 days, NOAA Fisheries will issue its Record of Decision document. This document brings the NEPA process for the Programmatic SEIS to a close. If a new or updated policy is selected, it will contain the agency's decision and its justification for the decision. It will then trigger processing of a FMP amendment that will revise the policy statements in both the BSAI and GOA Groundfish FMPs. The Record of Decision will also contain, in addition to the policy statement, an FMP framework and a time line that will serve to illustrate for the public the NPFMC's and NOAA Fisheries' intentions for implementing the selected policy.

8. Is the NPFMC committing to the implementation of specific bookend measures when it adopts the preferred alternative in the Programmatic SEIS?

No. The example FMPs only serve to illustrate a range of actions that the NPFMC and NOAA Fisheries have defined as their best illustration of the types of actions they intend to consider in applying its policy. The Programmatic SEIS action itself does not force the NPFMC or NOAA Fisheries to take the exact actions specified in the example FMPs. The example FMPs only illustrate a range of likely management measures from which the NPFMC and NOAA Fisheries may choose to enable implementation of the selected alternative. By design, the NPFMC and NOAA Fisheries attempted to make the example FMPs different in order to capture a meaningful range of future actions. Over time, the NPFMC will initiate FMP amendments and consider alternatives for specific actions. All of these future amendments will require analysis to satisfy NEPA, MSA, Regulatory Flexibility Act (RFA), and other applicable federal law. To the extent that the proposed actions fall within the range defined in the preferred alternative, the subsequent NEPA analysis can be tiered from this Programmatic SEIS and made more focused, thereby streamlining the regulatory process.

9. What specific management measures will be set in motion for implementation by the adoption of the preferred alternative?

None. Assuming a new policy statement is selected in the ROD, an FMP amendment will be submitted by the NPFMC to the Secretary and reviewed under Section 304 of the MSA. Specific regulations implementing that policy are not planned to be submitted with the new policy statement. However, the NPFMC and NOAA Fisheries will modify, over a reasonable time frame, specified in the ROD, the current suite of management measures to better meet the goals and objectives of the new or updated policy statement. If they so choose, the NPFMC and the agency may include in the ROD proposed regulatory changes to management measures simultaneously with the adoption of the preferred alternative. It is not anticipated that this will occur, however, and it is not required. The policy statement will set the stage for future actions. These future actions will most often be accompanied by fishing regulations.

10. What is the baseline that you used as a reference point for analyzing the impacts of the alternatives?

For this revised draft Programmatic SEIS, we used 2002 as our environmental baseline. NEPA requires that we define our affected environment (see Chapter 3). Our “snapshot” of the environment is the condition that existed in 2002, to the extent that we can describe it. Our regulatory baseline was the BSAI and GOA FMP in effect following the June 2002 NPFMC meeting. This baseline condition was used as the reference point when analyzing the changes that could occur if one of the alternatives, or its example FMPs were approved. If the alternative resulted in no significant change to the baseline, we would conclude that the alternative or its example FMP resulted in insignificant changes to the human environment. In instances where we determined that potential significant impacts could occur, we identify those impacts as being either conditionally significant, or significant (beneficial or adverse).

11. Why isn't there always a difference between Alternatives 1, 2, 3 and 4 for some effects?

It is due to the fact that sometimes the alternatives result in similar impacts on a particular resource. A Programmatic EIS is a big picture environmental assessment and the geographic scale and scope of analysis is very broad. For example, the four alternatives were found to share the same finding as Alternative 1 for impacts to the current baseline for herring at the population level. All four alternatives resulted in insignificant impacts on herring mortality, reproductive success, prey availability, and herring habitat. All alternatives are different in terms of predicted bycatch of herring in the groundfish fisheries, which can result in serious allocation issues, but at the population level, none of these alternatives were determined to pose a serious threat to sustainability of herring populations.

12. What FMP components have greatest influence on the total effects of a FMP?

The analysis contained in this Programmatic SEIS has revealed that three FMP components are the principle drivers behind an FMP and that the environmental consequences for the plan as a whole are influenced most by these FMP components. For every example FMP, the most influential components affecting the outcome and overall ratings were TAC-Setting (how much fish, target and bycatch, is allowed), resource and community allocation (who can fish), and spatial closures (where can they fish). All other FMP components, while important for successful management of the fisheries, were found to have relatively minor influence on the overall rating of the FMP.

13. What is the difference between “overfished” and “overfishing”?

Overfishing is the act of fishing at a higher rate than that defined as the overfishing rate. In Alaska, groundfish overfishing rates are specified as the rate that would be expected to produce the MSY. Groundfish fishing at a higher rate would constitute overfishing.

Overfished means a stock has been fished to a point where the population is below a threshold population size (commonly taken to be about one-half of the target stock size or B_{MSY}) necessary to produce the MSY on a continuing basis.

14. Will any of the alternatives result in overfishing?

No. All of the alternatives prevent overfishing by design, although the risks of overfishing do vary among alternatives, with Alternative 2 posing the highest risk and Alternative 4 the lowest risk.

15. Is it true that fishing on a stock (Bering Sea pollock for example) can actually be beneficial to the population as a whole?

If the term “beneficial” means surplus production, then yes, fishing can improve a stock’s ability to increase surplus production. If a stock is at its carrying capacity, then surplus production is zero. Principles of fisheries science tell us that by reducing the size of the population, the population turnover increases and over time will produce a surplus beyond what the stock needs to sustain its population.

16. Is there uncertainty and risk to the environment as a result of authorizing the groundfish fisheries in the BSAI and GOA?

Yes there is. We do not know the full effects of commercial fishing on the environment, nor do we understand the effects of fishing on the ecosystem and its processes. We have a choice as both managers and stewards of marine resources, and as a society. We can either move forward, cautiously and carefully in our management of fisheries, or we can reduce our harvests and perhaps even suspend some or all groundfish fisheries until we know more about our environment and the effects of fishing upon that environment.

17. How is uncertainty addressed across the alternatives?

Uncertainty is accounted for through regular development of stock assessment analyses. That is, as part of the regular review of stock assessments, robustness to model assumptions is continually evaluated. While this evaluation is objective, the risks of overfishing are treated differently than the risk of under exploiting stocks. These risks are presented annually to the NPFMC before they recommend ABC levels to NOAA Fisheries. For example, model alternatives that resulted in higher ABC's for Greenland turbot in the BSAI were rejected in 2002 over concerns about the change in recruitment pattern observed on the eastern Bering Sea shelf from resource survey data. In this case, the more conservative model alternative was selected even though the fit to the data was better for the models that were less conservative.

More formal inclusion of risk-averse policies that relate to the uncertainties both in the observation error and in recruitment variability are taken into account under Alternative 3. These allow for a constant level of risk for all stocks. A different adjustment to the maximum permissible ABC level is used for Alternative 4 (based on the lower 90 percent confidence interval). This adjustment is more ad-hoc in that it fails to have a constant level of risk-aversion for all stocks.

18. Are there environmental trade-offs in groundfish fisheries management?

Yes. NEPA defines the human environment as being comprised of the natural and physical environments and the relationship of people with those environments. This Programmatic SEIS shows that with already established fisheries, continued use of fishery resources comes at a cost to the physical and natural environment. The challenge for society that falls on to the NPFMC and NOAA Fisheries is to balance environmental protection with resource use in a manner that achieves the best combination of benefits to the human environment as a whole.

19. How are these trade-offs considered and balanced?

The MSA, ESA, MMPA, and other applicable federal law, provide standards, objectives, and requirements with which the NPFMC and the agency must comply. Balancing all of these values and mandates forces decision makers to identify the action that achieves as many of these requirements as possible while violating none of them. Both the MSA and NEPA specify that a public process will be undertaken when making decisions so that decision making is transparent and the public have the opportunity to be informed and to participate.

20. What are the cumulative effects of groundfish fishing over the last 25 years?

Over the last 25 years, management of the groundfish fishery has undergone a transition from a primarily foreign fishery, through a brief joint venture period, to a completely domestic fishery. Areas fished, the nature and efficiency of gear types, utilization of catch, and rates of bycatch have changed significantly. The diversity of groundfish species fished, and the volume of catch increased through the early 1990's, and has since remained stable; value of catch has continued to increase over time. Communities that participate in or support groundfish fishing have experienced cumulative beneficial effects, particularly in proportion to other state and federal fisheries. Alaska Natives that participate in the groundfish fisheries have experienced cumulative beneficial effects for themselves and their communities. There appear to be no adverse cumulative effects of groundfish fishing on target species. Management of the fishery has become more precautionary over time and developed extensive scientific knowledge regarding target species. Human activities over time have resulted in cumulative conditionally adverse effects on various components of the ecosystem including changes in species diversity, such as whales and harbor seals, western Alaska salmon, king and Tanner crab, and some types of benthic habitat. However, there is still uncertainty regarding the contribution of the domestic groundfish fishery to past cumulative effects on the North Pacific ecosystem. As more research has become available on other management issues such as ecosystem effects, fisheries management has incorporated measures to account for them, including temporal and spatial closures and fishing and gear changes.

21. Do the current management policy and FMPs incorporate ecosystem-based management principles?

Ecosystem-based management principles include the recognition that our ability to predict ecosystem behavior is limited and that diversity is important to ecosystem functioning. The current policy and FMPs incorporate ecosystem-based management principles primarily through management strategies that incorporate uncertainty, take into account the needs of other species, and those that promote participation, fairness, and equity in policy and management. Protection measures for dominant target species, ESA-listed species, prohibited species, and forage species ensure the protection of food web components that are more well-studied than others and those that are at critical population thresholds, but may not provide sufficient protection to others with less-complete information.

22. What alternative best incorporates ecosystem-based management principles?

The ecosystem-based management principles recommended by the NOAA Fisheries ecosystem advisory panel and the National Resource Council include the recognition that our ability to predict ecosystem behavior is limited and that diversity is important to ecosystem functioning. Management policies that achieve those principles are policies that incorporate uncertainty, take the needs of other species into account, and promote participation, fairness, and equity in policy and management. Although Alternative 4 policies are strong in incorporating uncertainty and taking the needs of other species into account, these do so at the expense of fishers and communities dependent on these resources. Alternative 3 appears to provide the best balance of policies that take uncertainty and the needs of other species into account while still allowing participation and equity in its regulation of humans.

23. Do the policy alternatives comply with MSA National Standards, MMPA, and ESA?

The policy alternatives have been designed to take into account the requirements of all applicable federal statutes and executive orders including the MSA, MMPA, ESA, NEPA, and RFA. However, analysis has shown that Alternatives 1 and 2 may not satisfy the MSA requirement that MSSTs be specified in the FMP or the National Standard Guidelines for determining whether a stock is currently overfished or approaching an overfished definition. Under Alternatives 1 and 2, MSSTs are operationally taken into account in the management of the fisheries, but MSSTs are specified in the Stock Assessment and Fishing Evaluation documents and not the FMPs.

Alternative 2 may satisfy ESA at the policy level, but analysis of FMP 2.1 could result in the increase in harvest levels of prey species and the reopening of a number of closed areas. Such a FMP bookend may not comply with ESA without additional Steller sea lion protection measures. In addition, depending on the application of the policies, goals, and objectives in Alternative 2, bycatch measures may not necessarily satisfy the requirements of National Standard 9, which requires that bycatch and/or bycatch mortality be minimized.

24. Do any of the policy alternatives result in fisheries harvests on Steller sea lion prey species that could adversely effect their recovery?

Yes, the Alternative 2 policy. Under FMP 2.1, the combined harvest of all three key Steller sea lion prey species were determined to likely have a population-level effect on Steller sea lions and were found to be significantly adverse. The fishing mortality rate (F) over the next 5 years of EBS and GOA pollock is expected to increase by an average of 140 percent and 100 percent, respectively, relative to the comparative baseline of 2002. Although F of EBS pollock under baseline conditions has been qualified as being “artificially low” because TAC was capped by the OY, the EBS pollock F is expected to increase by 140 percent under FMP 2.1 relative to the comparative baseline (Baseline F = .22, 5 year average F from projections; under FMP 2.1 = .44). This projected increase in the harvest of this key prey species, relative to the comparative baseline, is expected to have significant adverse effects on Steller sea lion populations.

For other key species under FMP 2.1, the BSAI and GOA Pacific cod fishing mortality rate is expected to increase by 79 percent and 64 percent, respectively, and changes in AI Atka mackerel harvest are expected to increase by 124 percent, relative to the baseline. All of these increases are considered to be significantly adverse to Steller sea lion populations.

The combined harvest of Steller sea lion prey species under FMP 2.1 meets the criteria defined for a significant adverse determination for prey availability of Steller sea lions.

Under FMP 2.2, F of EBS pollock is expected to increase by an average 69 percent and the GOA pollock will decrease by 13 percent. BSAI and GOA Pacific cod fishing mortality rate is expected to increase by 28 percent and 19 percent, respectively. Changes in AI Atka mackerel harvest are expected to increase an average of 64 percent under FMP 2.2 relative to the baseline. The combined harvest of Steller sea lion prey species under FMP 2.2 is therefore expected to result in either insignificant or significantly adverse effects to Steller sea lions for individual prey species and is rated significant adverse, overall.

25. Could any of the policy alternatives result in fisheries harvests on forage fish species that could adversely effect the recovery of short-tailed albatross?

Under FMP 2.1, the ban on directed forage fish fisheries would be repealed. If a market developed so that substantial amounts of capelin and other forage fish were harvested (along with expected bycatch of squid and other pelagic invertebrates), there would be a potential for localized depletions of prey used by short-tailed albatross. However, since short-tailed albatross primarily feed on squid and forage over vast areas of ocean, the potential effects of localized depletions of forage fish are considered minimal for this species. In addition, since the near extinction of short-tailed albatross was caused by commercial hunting rather than habitat degradation, the carrying capacity of the environment, which once supported millions of these birds, should not limit their population recovery for a long time.

26. Do any of the alternatives result in spatial or temporal concentrations of the catch? Could this concentration adversely impact Steller sea lions, seabirds, or EFH?

It's possible. Under Alternative 1, the groundfish trawl fishery is compressed in time and fishing occurs in areas of historically high catch rates. Whether such spatial or temporal concentrations of catch significantly harm the stocks or the environment is unknown. Our analysis of the spatial and temporal closures schemes illustrated by example FMPs 3.2 and 4.1 indicate that fishing effort would be relocated to areas where little is known about the availability of the target species. The effects of such relocation of effort on bycatch and benthic habitat are also unknown. Due to this uncertainty, the risk of causing unintentional impacts by the closures is high. Past experience has shown that bycatch of certain species could increase if the fishing fleet is forced to operate in areas it would not normally fish. It is presumed that the fishing fleet currently deploys to those open areas where the catch-per-unit-effort (CPUE) for target species is the highest. Naturally, in instances where CPUE is high for target species, bycatch rates for non-targets species or prohibited species should be low in comparison. Since the entire GOA and BSAI are not fished continuously, we expect that there are seasonal differences in stock availability and catch rates across the continental shelf. Experimental fishing or test fishing would provide some insight as to whether the target species, and their respective TACs, could be harvested in the open areas illustrated by these FMPs.

Effects of fishing on benthic habitat is currently a major topic of research. Whether redistributed effort results in adverse impacts to benthic habitat can not be determined at this time. What can be answered is that the closure scheme illustrated by example FMP 3.2 and 4.1 do result in a greater separation of the commercial fishery from Steller sea lion haulouts and rookeries as well as known seabird colony sites. What is unknown is whether such separation provides any real benefits to these marine mammals and seabirds.

27. How does the current gear specific closure scheme compare to past years? Are we being more protective of the environment now?

Overall, it appears that more of the EEZ or fishable area is being afforded some level of protection today than back in the late-1970s and early-1980s. More restrictions exist today on groundfish trawling compared to 1980. However, there are fewer area restrictions on fixed gear fisheries compared to 1980. As stated in this Programmatic SEIS, it is important to realize that benthic habitat is only fully protected from fishing impacts if a closure applies to all gear types and is in effect all year. Little area in the BSAI

or GOA has been designated that meets this criteria. Partial closures that permit some bottom trawling to occur negates the benefits that accrue to that benthic habitat by restricting only certain fisheries. For example, the current closures surrounding Steller sea lion rookeries and haulout sites, apply only to those fisheries that target Steller sea lion prey (e.g. pollock, Pacific cod, and Atka mackerel). Trawl fisheries targeting flatfish are permitted within these closed areas. Concerns exist that such trawl impacts on certain types of benthic habitat may require a recovery period that is not satisfied by restricting only the pollock, cod, and mackerel fisheries. Little difference between the 1980 regime and the 2002 regime exist in terms of the amount of area that is fully protected from fishing. Alternatives 3 and 4 could increase the amount of area that is fully protected from fishing by 3 to 11 percent for the EEZ, or by 8 to 29 percent for the defined fishable area. Unfortunately, there is no information to conclusively show whether fishing impacts on the benthic environment are adverse and whether meaningful benefits to the environment would accrue as a result of a modified closure scheme.

28. Can any of the TACs be fully achieved in the more precautionary or extremely precautionary policy alternatives?

Maybe. It is uncertain whether the current TACs could be taken if the fishing fleet were not permitted to fish in areas where they currently operate. Current catch levels are unlikely to be possible under Alternative 4. This is primarily because the TACs will be set much lower as a precautionary measure until scientific information is collected that would support an increase in harvest levels. This alternative would also emphasize the use of no-take marine reserves where all commercial fishing would be prohibited. The combination of reduced TACs with closures of large areas would make achieving the current TAC level difficult.

29. Will any of the alternative closure schemes prevent TACs from being achieved? If so, why?

Alternatives 3 and 4 include management measures that lead to the creation of MPAs, or areas closed to particular gear types. It is possible that areas could be created that would preclude the attainment of TACs of certain species. Whether or not the closures will actually prevent achievement of the TACs depends on the TAC levels, on the location of the specific areas created, and on the level of abundance of the species outside the closed areas. To the extent that a closed area comprises the majority of the range of a particular species, then it is less likely the TAC for that species can be attained. If TACs are reduced significantly, as could happen under Alternative 4, then, even if a closure encompasses a large portion of the natural range of a species, it may still be possible to harvest the lower TAC.

30. What alternative best mitigates the effects of fishing on EFH?

It is difficult to say. The use of closures as a management tool is probably the most effective habitat protection measure. However, with so little information currently available on the different habitat types in the BSAI and GOA, and the affect of fishing on those habitats, it is difficult at this time to determine whether benefits of a closed area outweighs the social and economic cost. Alternatives 1, 3, and 4 all have the potential of providing protection to EFH. However, it is difficult to determine if all the current areas being closed or restricted provide measurable benefits to EFH. Similarly, while our analysis of Alternatives 3 and 4 indicate that they both have the potential of increasing protection to EFH, example FMPs 3.2 and 4.1 may not provide all the benefits to EFH as originally believed and therefore they highlight the importance of making sure that the areas closed are based on the best available science.

31. Are closures good for habitat?

They can be if they are established in the right place. However, if a closure is established in an area of historically high catches, the displaced effort will relocate and it could lead to higher levels of habitat disturbance in other areas which may negate the habitat benefits of the closure.

32. What is the impact of fishing offal and discards on seabirds?

Scavenging of fishery wastes can influence seabird population trends in either direction. Processing wastes may not be adequate foods for successfully rearing chicks but abundant scavenging during winter may improve survival of immature birds and increase populations of the large, competitive gull species. On the other hand, if populations of the larger gull species increase, local populations of other species (such as kittiwakes and murre) may be reduced through increased competition for nest sites and predation pressure on their young. Sudden withdrawal of discards might cause the predatory species to increase pressure on other species long before the predator populations decline to previous levels. Research on seabird populations in the North Sea has documented numerous instances of potential relationships between offal and discards and changes in breeding populations. However, no data are available on how important these supplemental food sources might be for various seabird species in Alaska or whether there are regional differences in offal use by seabirds.

33. What is the economic value of the Alaska groundfish fisheries to the Pacific Northwest and Alaska?

The socioeconomic data currently available to NOAA Fisheries does not include data on production costs. Without information on harvesting and processing costs it is not possible to determine whether businesses are profitable, much less the magnitude of the profit or how it has been affected by regulatory changes. However, economic theory would suggest that average costs are less than or equal to gross revenues. In 2001, total revenues from processing and harvesting groundfish were estimated to have exceeded \$1.5 billion. The fishery supports thousands of regional jobs in both the fishing and support service industries. Revenues generated by commercial groundfish fishing are used by federal, state, and community governments to finance valued infrastructure and community services, and as such are important parts of the Alaska and Pacific Northwest economies. Measures to collect additional socioeconomic data needed to fully answer this question are included in Alternatives 1, 3 and 4.

34. What happened to supply and demand? In example FMP 2.1 the amount of catch increases significantly but you assume there are no changes in prices. Similarly the amount of catch decreases significantly under example FMP 4.1 but again it does not appear that prices change. Shouldn't prices change as a function of supply and demand?

The analysis does not attempt to measure any price changes that may result from regulation of the groundfish fisheries. Evidence from the market for groundfish suggests that most groundfish products are shipped to foreign markets and markets in the "lower-48," where they compete with other seafood products and other sources of animal protein. As a result of the presence of a large number of substitutes for Alaska groundfish products, the demand curve for these products is relatively elastic. In other words, prices for groundfish products are unlikely to be significantly influenced by changes in groundfish harvests in Alaska. The absence of a price change would have a negative impact on participants in

groundfish fisheries because little, if any, of their loss from harvest declines will be compensated for by a price rise.

35. Why do we prohibit harvesters that use specific gear types from retaining halibut and salmon, regardless of whether the fish are alive or dead? Can't we give the fish that would be discarded to food banks?

The purpose of PSC limits is to eliminate or substantially reduce the incentive for vessels to harvest certain non-groundfish species that are harvested in other domestic fisheries. At the same time, these restrictions recognize that some level of incidental catch of prohibited species can not be avoided without eliminating many groundfish fisheries. Amendment 28 to the BSAI FMP and Amendment 29 to the GOA FMP authorize a voluntary donation program for fish taken as bycatch in the groundfish trawl fisheries off Alaska. The seafood is distributed to economically disadvantaged individuals by tax-exempt organizations through a distributor authorized by NOAA Fisheries. Currently, the authorized distributor is Northwest Food Strategies (NFS), a 501 (c) 3 non-profit organization. NFS accesses seafood products for distribution to the America's Second Harvest network of 200 food banks and food-rescue organizations. Since its inception in 1994, NFS has grown into the leading supplier of seafood to hunger-relief organizations in the country. The fish voluntarily donated by the groundfish fishing industry to NFS are salmon and halibut that are part of the groundfish fishery PSC. The salmon and halibut retained and donated under the NOAA Fisheries Prohibited Species Donation Program represent a small but significant portion of the seafood distributed by NFS. It is estimated that catcher processor companies donate one million seafood meals annually to provide hunger relief.

36. I live in Sandpoint, Alaska and I don't see anything in the Programmatic SEIS about the importance of groundfish to my community nor is there anything on the impact of the alternatives on my community. Will this shortcoming be addressed?

Because of the geographic scope of the Alaska groundfish fisheries, much of the social impact assessment information in the main body of the document is provided at the regional level. Community differences are highlighted in each discussion area, but much more detail on Sand Point itself and other fishing communities may be found in the *Interim Updates of Sector and Community Profiles*, on the NPFMC website at www.fakr.noaa.gov/npfmc. This document, incorporated by reference into the Programmatic SEIS, contains a detailed groundfish oriented profile of many of the fishery dependent communities including Sand Point. The profiles describe community engagement in, and dependence upon, the groundfish fishery. In terms of impacts of the alternatives to the community of Sand Point, quantitative information cannot be provided at the community level due to data confidentiality restrictions. However, the discussion of impacts to the Alaska Peninsula and Aleutian Islands region as a whole are applicable to Sand Point, and provide information on the nature, direction, and magnitude of the impacts that would be felt in the community.

37. I run a fuel supply business operating in Dutch Harbor and Bellingham, how can I tell what the impacts of the Programmatic SEIS will be on me?

As noted in the Chapter 4, the impact to support service sector businesses are likely to be somewhat different than the impacts to direct fishery sector businesses, depending on the specific alternative chosen. Both direct and support sector business activity is assumed to remain near to or exceed existing

conditions levels under Alternatives 1 and 2, and both direct and support sectors are expected to decline under Alternative 4. Assuming your business varies with the volume of fishery activity in the region, you may be able to roughly gauge increases or decreases in demand by looking at the overall percentage change in regional indicators under those alternatives. Under Alternative 3, however, the outcomes for direct and support sectors may vary. As discussed in Chapter 4, support sector businesses (and some coastal communities that have large support sectors) that derive benefits from seasonal peaks (and the economic inefficiencies) of current race-for-fish fisheries could experience adverse impacts under rationalization conditions, at least in the short term during a transition to a lower if more stable level of employment.

Unalaska/Dutch Harbor has a relatively well developed support service sector that supports all major fishing industry segments, and this sector derives marked benefits from the current economic inefficiency within the fishery. It is relatively expensive to provide services in the community, but under conditions where it is important to minimize down time during a fishing season, services that cost more in Unalaska/Dutch Harbor than some other places (but are available on a more timely basis) are often deemed well worth the trade-off by fishery participants. Under a rationalized fishery, cost considerations become relatively more important (as the relative cost of time away from the fishing grounds decreases), giving service purchasers more options (to the possible detriment of providers in relatively remote locations). How your particular business changes as a result of fishery management changes depends, of course, to a large extent on the adaptability of the business to changed circumstances, which in turn depends on the relative economics of your business compared to other local providers of the same service.

38. In several of the alternatives, the concept of “rights-based management” appears. What is rights-based management?

A “rights-based management” approach to controlling harvesting and processing capacity in fisheries relies on incentive adjusting methods, such as the allocation of shares of the TAC to specific individuals or groups. With secure “rights” to specific quantities of fish, there is no incentive for fishermen to invest in ever more elaborate vessels or equipment—or, to be more precise, to select anything but the least cost combination and deployment of fishing inputs. In other words, rights-based management systems (in which rights are freely transferable) are “self-rationalizing” systems. Redundant capital is removed from the fishery as more efficient operations purchase the rights of less efficient operations. In economic theory, the less efficient operations, having sold their rights to participate, will exit the fishery and shift their labor and capital to some underutilized fishery or into an entirely different segment of the economy. The result is a net gain to society in the form of a reduction in costs and an increase in production. For more information on rights-based management in the groundfish fisheries, please see the QA paper on overcapacity in Appendix F-8.

39. Does “rights-based management” give an exclusive right to some individuals while keeping out others? Why are we giving away the public resource?

The MSA refers to an IFQ as an exclusive “fishing privilege,” rather than a right. In specific reference to authorizing IFQs or other limited access systems, the MSA states that such an authorization, “(A) shall be considered a permit for the purposes of sections 307, 308 and 309; (B) may be revoked or limited at any time in accordance with this Act; (C) shall not confer any right of compensation to the holder of such

IFQ or other such limited access system authorization if it is revoked or limited; and (D) shall not create, or be construed to create, any right, title, or interest in or to any fish before the fish is harvested” [Sec. 303(d)(3) 16 USC 1853(d)].

40. Won’t “rights-based management” result in windfall gains (or the appearance of windfall gains) to permit holders from the reallocation of a public asset to private holdings?

First, it is important to recognize that our nation’s fishery resources are given away at no charge when fisheries are managed through open access. Nevertheless, a potential and frequently anticipated effect of rights-based management is the provision of an apparent windfall profit (i.e., the ability to sell quota shares for which they did not have to pay) to the initial permit holders. Anyone receiving quota shares without explicit payment receives an increase in tangible wealth. The increased value of this wealth due to the efficiencies of the rationalization program is often seen as the source of windfall profits. Various mechanisms, such as the auctioning of quota shares or making them taxable, have been suggested to reduce or eliminate windfall profits and to recover for the nation the fair market value for private use of the natural resource. However, the MSA explicitly prohibits such mechanisms (as Sec. 304 (d) has been interpreted by NOAA Fisheries). There are differing viewpoints as to whether the MSA should be modified to allow an auction system or the imposition of taxes and, if so, how such authority should be utilized. Currently the sablefish IFQ cost-recovery program is authorized to collect up to 2 percent of the ex-vessel value of sablefish to pay for the costs of administering the program. Additionally, specific measures in Alternative 3 would include a cost recovery program, and it is conceivable that if rights-based management measures are eventually approved under Alternative 1, they would also include cost-recovery mechanisms.

41. Why not let the race for fish continue? If boats and processors can't make it, then they'll go out of business-that's the American way?

The “race for fish,” in which each fisherman is motivated to be the first to capture fish, is undesirable because it usually leads to excess harvesting and processing capacity. The problems of excess capacity have been summarized by Kirkley and Squires (1999): *[Excess capacity] generates intense pressure to continue harvesting past the point of sustainability in order to keep as much of the fleet working as possible. With revenues spread among many vessels operating under little or no profits, reductions in fleet size become politically and socially more difficult. Vessels are more vulnerable to changes in the resource base and regulations when they are only marginally viable because of excess capacity. Excess capacity encourages inefficient allocation and constitutes a major waste of economic resources. Overcapitalization and excessive use of variable inputs follow. Excess capacity also complicates the fishery management process, particularly in open access, frequently leading to detailed and comprehensive regulation. Excess capacity substantially reinforces the increasing tendency for management decisions to become primarily allocation decisions, i.e. decisions about the gainers and losers of wealth and profits (or losses) from alternative management choices over an overfished or even declining resource stock.* For more information on the effects of the race for fish and the problem of excess capacity in the groundfish fisheries, please see the Qualitative Analysis paper on overcapacity (Appendix F-8).

42. What is the difference between bycatch, incidental catch, and discards?

The terms “bycatch” and “incidental catch” are often used interchangeably by fishermen and the public when referring to the catch of groundfish or other species that is taken incidentally when targeting other fish species and thrown away. However, legally, the two terms mean different things. The term “incidental catch” is defined by federal regulations (50 CFR 679.2) and refers to that catch that is taken while targeting some other species but is retained and used (e.g., cod taken in a pollock fishery). “Bycatch” is defined by the MSA as the portion of the catch that is not used and discarded. This discarded incidental catch may include regulatory discards defined by the MSA as fish harvested but are required by regulation to be discarded whenever caught (e.g., in Alaska these species are called “prohibited species”); and fish species that are undesirable and have no market, such as sculpins and skates. The MSA further defines economic discards as fish which are targeted in a fishery but are not retained because they are of an undesirable sex, size, or of poor quality.

43. Why does the analysis indicate that right-based management will lead to reductions in bycatch and incidental catches? What evidence exists that leads to this conclusion?

With a rights-based management program, as evaluated in the example FMP bookend 3.2, it is assumed that individual fishing vessels would be held accountable for their total catch of target species, prohibited species, and the non-specified species. For the target and prohibited species categories, each fishing vessel would receive species specific allocations which it could either use directly in its own fishing activities or transfer to another fishing operation. For the non-specified species category, there would not be allocations to individual fishing operations; however, the catch of these species would be counted against a fishing operation’s total allocation of target species. Therefore, there would be an opportunity cost borne by the fishing operation for its catch of each of these three types of species. This management scenario would provide each fishing operation with an increased incentive to develop a fishing strategy that will decrease catch of species which would not be retained.

In addition, rights-based management will tend to decrease the cost of developing and using fishing strategies that decrease discards. This is the result of eliminating the “race for fish” as the allocation mechanism. The race for fish increases the opportunity cost of using fishing strategies that decrease the rate at which a vessel can harvest fish. For example, the time lost searching for areas with lower bycatch rates may be prohibitive in the very short season that can occur due to the “race for fish” style season. As experienced in the Alaska sablefish and halibut IFQ fisheries, elimination of the “race for fish” will result in an increase of the length of time a fishing vessel has to profitably retain catch that would otherwise be discarded.

One other benefit of rights-based management: fishermen are given better business “signals” from this type of management program; therefore, they tend to make better decisions that are more appropriate from society’s perspective. This is the result of internalizing what had been external costs and benefits (i.e., costs and benefits that do not accrue to the fishing operation as a result of the fishing strategy it selects). The specifics of the rights-based system will determine the types of externalities that are addressed and the extent to which they are internalized. Such externalities are the source of a variety of fishery management problems, including excessive levels of discards. Therefore, example FMP 3.2 is expected to decrease discards by at least partially internalizing what are currently the external costs and benefits of decreasing discards.

44. Our community is completely dependent on the fishing and processing industry, however the regional impact analysis for the region I live in has lower income and employment multipliers than other regions that are less dependent on fishing. Are your multipliers correct?

The income and employment multipliers used in the regional effects analysis in this Programmatic SEIS are based on the most current information available from IMPLAN[®], an input-output analysis software program that is generally regarded to provide accurate results. The multipliers indicate the additional income and employment that will be generated when industries produce and export their product outside the region. Multipliers will be higher in regions that produce a wide variety of potential inputs to the industry in question. If, for example, the fishing industry in a region purchased all of its vessels and engines from a local manufacturer the multiplier for the fishing industry would account for the additional jobs created in the vessel and engine manufacturing sectors. If instead, the industry purchases its vessels and engines from outside the region, jobs and income in some other region are affected rather than in the region itself. From this perspective, the more dependent a region is on a single industry, the lower its multipliers. Thus, the multipliers in Aleutian Islands are lower than the multipliers for southcentral Alaska.

45. How are environmental benefits such as viewing sea lions accounted for and compared to the benefits from the commercial harvesting and processing of fish?

The economic analysis contained in this Programmatic SEIS discusses the full range of benefits that the BSAI and GOA marine ecosystems and species associated with them (including sea lions) provide to the American public. Some of the goods and services these ecosystems produce are not exchanged in normal market transactions but have value nonetheless. While there are difficulties in estimating the value the public places on protecting ecological conditions, the analysis provides a qualitative discussion of possible benefits provided by the BSAI and GOA marine ecosystems. In addition to supporting commercial fisheries, these ecosystems support an array of recreational fishing and subsistence activities as well as non-consumptive activities such as wildlife viewing. Furthermore, some people may not directly interact with the BSAI and GOA marine ecosystems and the various species associated with them but derive satisfaction from knowing that the structure and function of these ecosystems are protected. For more information on the range of benefits these marine ecosystems provide, please see Section 3.9.7.

46. In your assessment of non-market, recreational and tourism values, you indicate that the effects of FMP 1 are insignificant. I don't consider myself an environmentalist, but I am concerned about the effects of fishing on the endangered stock of Steller sea lions. If fishing has a negative effect on Steller sea lions how can the rating of FMP 1 be insignificant?

The significance ratings for each example FMP studied in this Programmatic SEIS is based on the question of whether there will be a significant change to the baseline at the population level as a result of the FMP. It does not mean that the NPFMC or the agency is satisfied with the current state of the environmental baseline. For example, FMP 1 would continue the current suite of Steller sea lion protection measures to avoid jeopardy and adverse modification to their critical habitat. We have determined that FMP 1 would not significantly change the current management of the fisheries and so there would be no predicted beneficial or adverse change to the recovery plan currently in place. It is predicted that measures contained in example FMPs 3 and 4 would more likely result in changes believed

positive to the recovery of Steller sea lions and so these FMPs received a conditionally significant beneficial rating.

47. I operate a small 58 ft trawler. Although I favor the rationalization measures in Alternative 3, the closures that are also included are likely to make it impossible for me to operate. The impact analysis seems to underestimate the impacts of these closures. How come, and is there any way these shortcomings can be addressed?

Data necessary to make reliable quantitative projections of the impacts of closed areas were unavailable for use in the Programmatic SEIS. The illustrated closures used in this Programmatic SEIS are examples and only used for purposes of analysis. Adoption of a preferred alternative will not necessarily lead to implementation of these closures. The Programmatic SEIS analysis uses the illustrations to provide insight into the likely effects of closures. These effects can be used to highlight concerns and shape management policy. At such time in the future that specific closed areas are proposed following adoption of a preferred alternative, it is hoped that improved habitat data will allow for reliable quantitative estimates to be developed. Estimates of the percentage of catch by species that occurred in the proposed closed areas during the baseline period are shown in the habitat analysis of the alternatives. It is assumed that catch that is foregone in closed areas will be available to fishermen in areas that remain open because fish are mobile and generally widely dispersed. Our analysis shows that if this is true, smaller vessels could be affected to a greater degree compared to large vessels if the proposed closed areas are close to shore where small vessels often are forced to operate due to safety concerns.

48. Can any of the policy alternatives adversely impact subsistence?

Yes. Groundfish fisheries managed under Alternative 2 could produce adverse indirect and cumulative effects on subsistence salmon harvests by increasing the bycatch of chinook and chum salmon in the BSAI, and by increasing the likelihood for fishery disturbance and competition for prey with Steller sea lions, a marine mammal used for subsistence. Alternatives 3 and 4, while potentially providing direct benefits to subsistence users by reducing salmon bycatch and reducing disturbance to Steller sea lions, are not enough to overcome the cumulative adverse effects of both human and natural events on Yukon-Kuskokwim River salmon stocks.

49. Do any of the alternatives adversely impact minority populations?

Yes, there are three potential effects of the groundfish fisheries on minority populations: adverse effects on Alaska Natives related to subsistence harvests; adverse effects on CDQ groups and other Alaska Natives participating in the groundfish fishery; and adverse effects on other minority populations participating in the groundfish fishery. Alternatives 2 and 4 appear to produce the most significant adverse effects on minority populations in Alaska. Alternative 2 will have potential adverse effects on subsistence harvests by Alaskan Natives of salmon (increasing salmon bycatch) and Steller sea lion (increasing disturbance and competition for prey). Alternative 4, which could significantly reduce groundfish TACs will have adverse effects on Alaska Natives participating in groundfish fisheries and Alaska Native communities that are economically dependent on those fisheries by reducing or eliminating their participation on the groundfish fishery. The alternative would also have adverse effects on minority populations employed in fish processing as a result of reduced groundfish TACs.

50. Of the policy alternatives, which are most dependent on new research and scientific information?

All of the policy alternatives require some level of research and monitoring. However, Alternatives 3 and 4 both require increased levels of research and monitoring, beyond the current program, to fully achieve their respective policy goals and objectives. A description of ongoing, planned and recommendations for future research is provided in Chapter 5 of this Programmatic SEIS.

ES 11.0 What Are the Next Steps in the Programmatic Supplemental Environmental Impact Statement Process?

This executive summary is a snapshot of the contents of the second draft Alaska Groundfish Fisheries Programmatic SEIS released in early September 2003. Comments on the draft Programmatic SEIS will be accepted during the 45 public comment period. Everyone is invited to submit comments to NOAA Fisheries. During the comment period, public hearings will be held at various locations in Alaska and in the Pacific Northwest. These meetings will offer a forum to meet members of the Programmatic SEIS team, ask questions, and provide formal comments to the agency. Comments received at the hearings, in writing, and through NOAA Fisheries e-Comments webpage, will be reviewed by the NPFMC and NOAA Fisheries and considered prior to making its final decision on choice of policy alternative. The webpage on the Internet for reviewing the revised draft Programmatic SEIS, and to submit written comments electronically, is at www.fakr.noaa.gov/sustainablefisheries/seis/default.com.

ES 11.1 Your Opportunity to Contribute

The future of the Alaska groundfish fisheries is important to everyone. The public has been involved in the management of the groundfish fisheries at the NPFMC level for more than 25 years and has been involved in the NEPA process from the beginning of this Programmatic SEIS in the fall of 1999. From the scoping meetings conducted in January 2000 through the comment period on the first draft Programmatic SEIS and the restructuring of the alternatives, NOAA Fisheries has solicited and incorporated public comments into this Programmatic SEIS and the decision process.

Choosing a preferred alternative is a difficult task. This Programmatic SEIS serves as an environmental review of the BSAI and GOA groundfish FMPs. The Programmatic SEIS describes the evolution of fisheries management in Alaska and identifies the environmental issues that could impact managers and the stakeholders of these resources in the future. Four alternative FMP frameworks have been carefully crafted around the key environmental issues and emphasized policy objectives as a basis for illustrative FMP bookends used in the Programmatic SEIS analysis. These environmental consequences are discussed in detail in this Programmatic SEIS.

This Programmatic SEIS is a large document and contains a large amount of information regarding Alaska groundfish fisheries management. The complexities of the fishery itself have required a similarly complex program for effective management. We hope you take the time to review the information contained in this document and that you find it to be a useful planning and reference tool.

ES 11.2 For More Information

You can request more information about this Programmatic SEIS, be added to the Programmatic SEIS mailing list, learn more about the project, submit your comments (during the official public comment period), and become involved in the process by:

- Visiting the general NOAA Fisheries Alaska Region website at: www.fakr.noaa.gov
- Mailing your comments to:
National Marine Fisheries Service
Alaska Regional Office
P.O. Box 21668
Juneau, AK 99802
Attn: Lori Gravel
- Visiting the new NOAA Fisheries E-comments website and submitting your comments electronically at: www.fakr.noaa.gov/sustainablefisheries/seis/default.com

Dates and locations of the public hearings will be announced. Visit the website or contact NOAA Fisheries to be sure to receive notice of these meetings.

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